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STEEL

The Magazine of Metalworking and Metalproducing

CONTENTS—PAGE 47

AT SAME DRAWING SPEED

Clearing *HiProDraw* Cycles in 5 Seconds

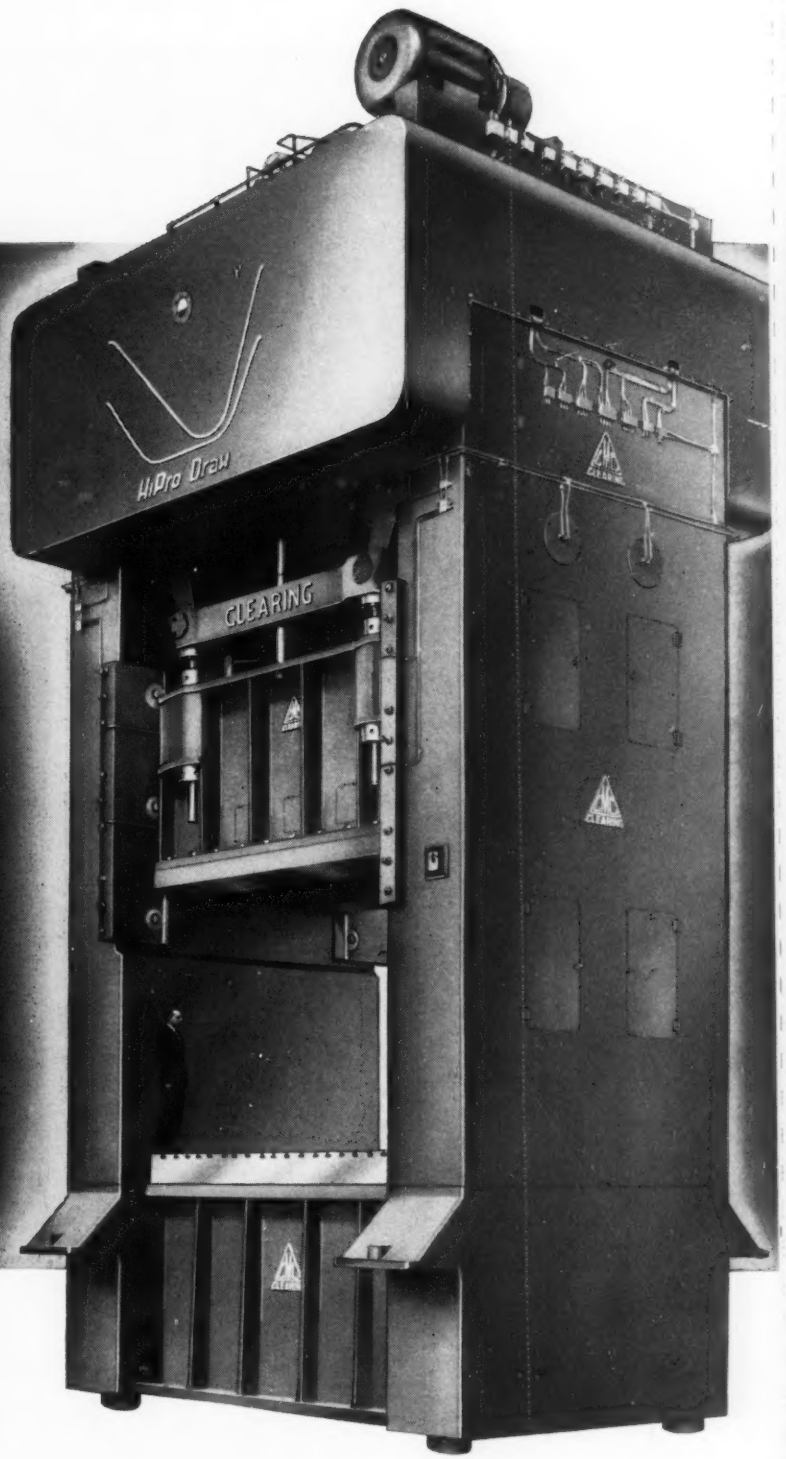
Conventional press requires 8½ seconds

UP TO 70% FASTER PRODUCTION

This mechanical, double-acting press provides fast approach and return combined with reduced speed during actual draw. It will deliver up to 70% more pieces per hour without drawing any faster than an ordinary double-action press. Write for full details about the new

CLEARING

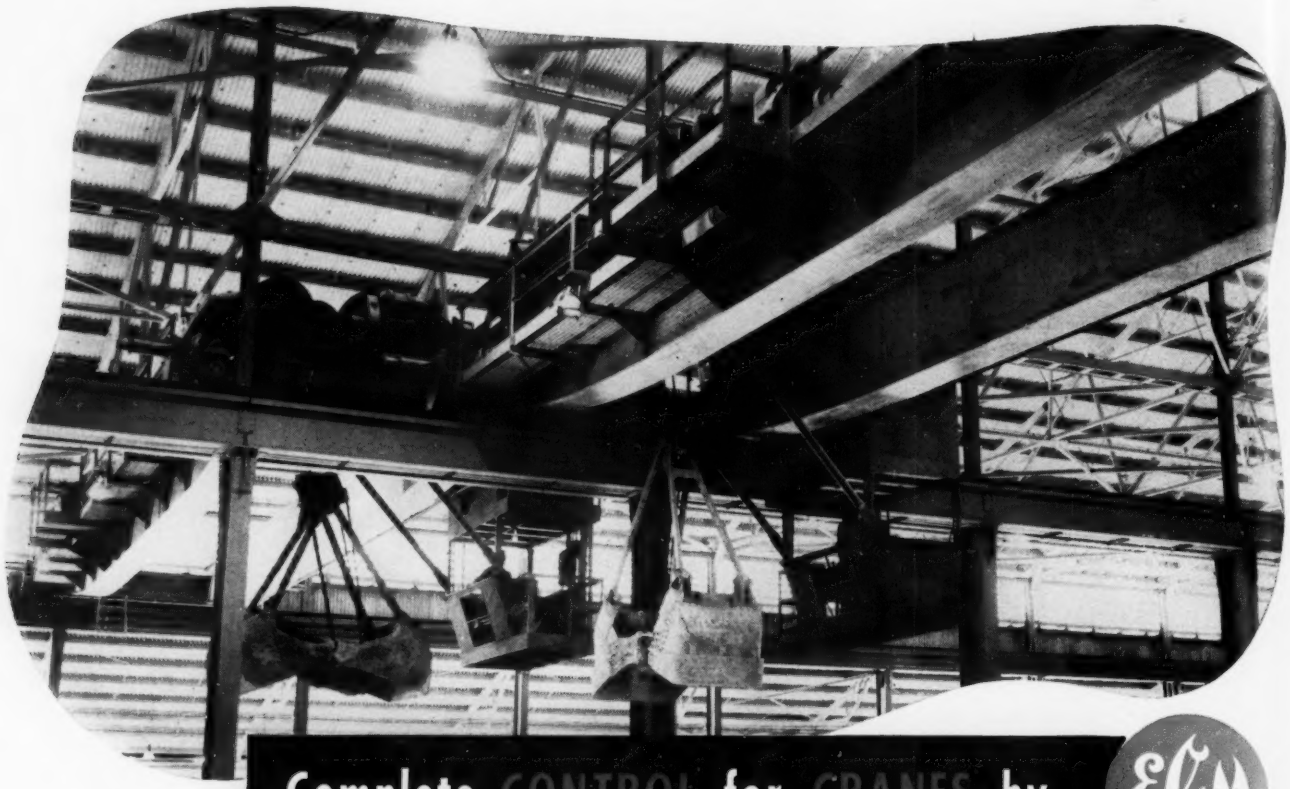
HiProDraw



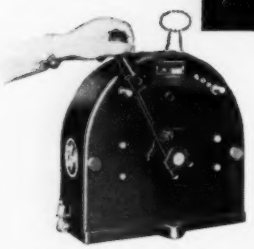
CMC CLEARING

CLEARING MACHINE CORPORATION

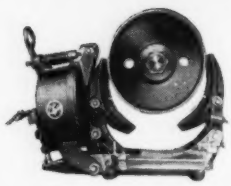
6499 WEST 65TH STREET • CHICAGO 38, ILLINOIS



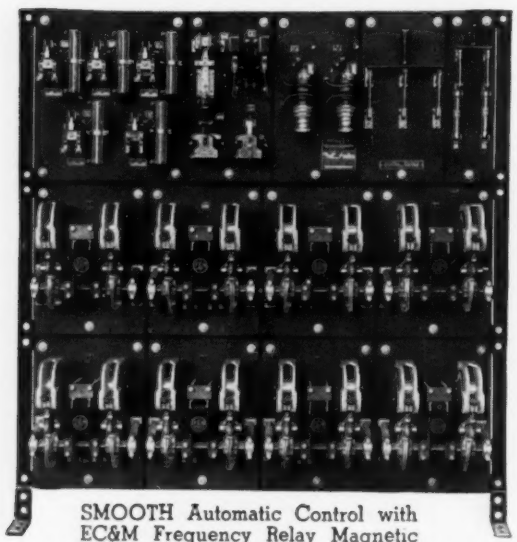
Complete CONTROL for CRANES by E&M



SHORT-THROW Narrow-width Cam Master Switches are easy on the operator.



LONG - LIFE Brakes give high-speed performance — with low up-keep.



SMOOTH Automatic Control with EC&M Frequency Relay Magnetic Controllers.

Users Know EC&M Equipment Gives Top Performance . . . Low Up-Keep

EC&M Crane Apparatus and Control Engineering have a reputation for eliminating initial delays and for permitting production to be maintained at a high level throughout the life of the investment.

EC&M Crane Equipment is specially engineered for *each* crane. EC&M has *always* built control from the crane data sheet. Relay-settings, resistor-fillings, brake-windings, etc., are matched to the actual crane-loading. Result is top performance right from the start.

Many crane users, when buying new cranes or revamping existing installations, specify EC&M Control. They know the extra margin of safety built into EC&M Equipment and the accurate engineering of the apparatus result in freedom from delays—smooth performance. Write EC&M into the specifications for your next crane.

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79th STREET • CLEVELAND 4, OHIO

When Buying Cranes . . . Specify EC&M CONTROL

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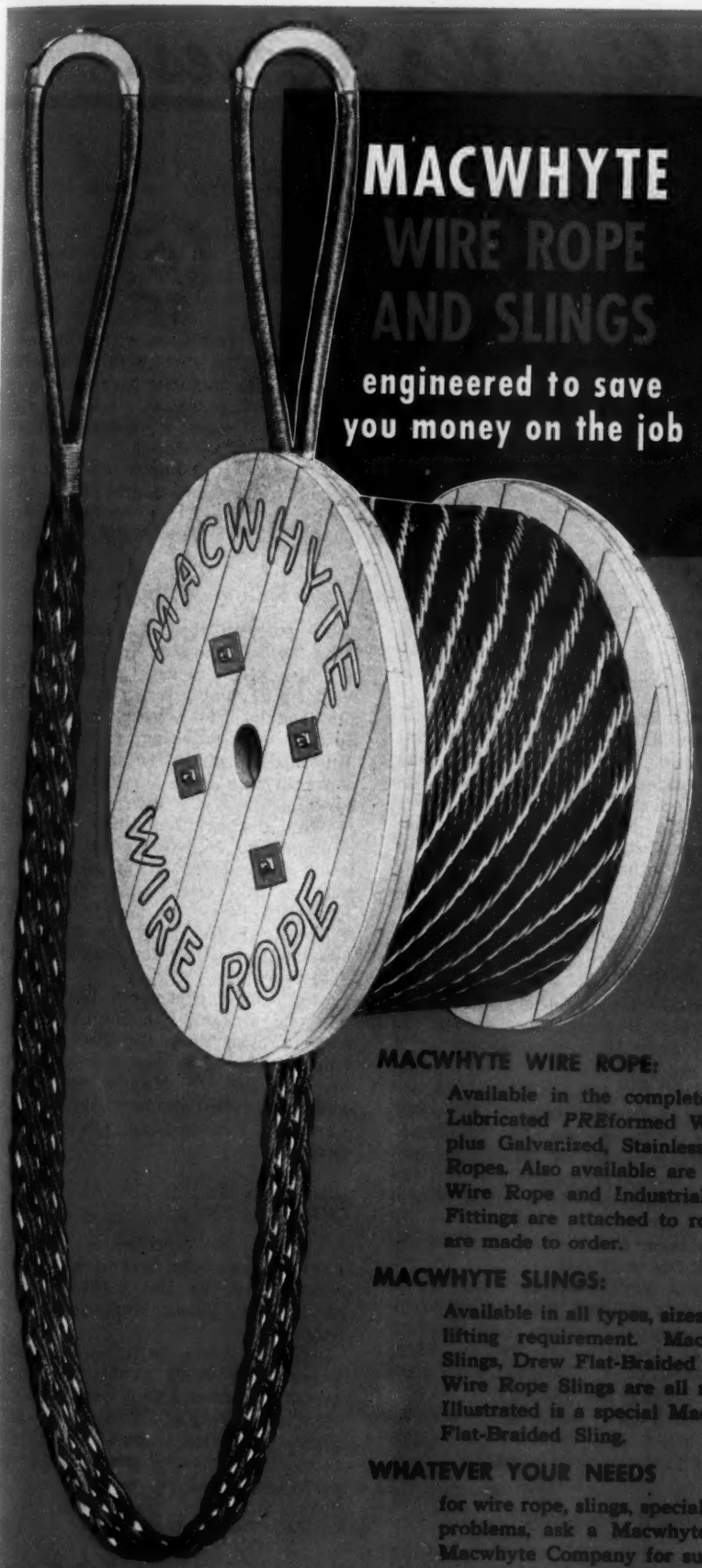

MACWHYTE WIRE ROPE AND SLINGS

engineered to save you money on the job

Ask Macwhyte to recommend the type and size of wire rope best suited for your needs. *There are a thousand and one wire ropes made by Macwhyte.*

Specifications for the correct sling for any lifting need are yours from Macwhyte for the asking.

Prevent loss!
Save time!
Be sure!

MACWHYTE WIRE ROPE:

Available in the complete Macwhyte line are Internally Lubricated *PRE*formed Wire Ropes for all equipment—plus Galvanized, Stainless Steel, and Monel Metal Wire Ropes. Also available are special assemblies of Macwhyte Wire Rope and Industrial Standards "Safe-Lock" fittings. Fittings are attached to rope by swaging—and assemblies are made to order.

MACWHYTE SLINGS:

Available in all types, sizes and lengths, to meet almost any lifting requirement. Macwhyte ATLAS Round-Braided Slings, Drew Flat-Braided Slings and Monarch Single-Part Wire Rope Slings are all made to order to fit your needs. Illustrated is a special Macwhyte Drew 14-part Type 1CT Flat-Braided Sling.

WHATEVER YOUR NEEDS

for wire rope, slings, special assemblies, solutions for special problems, ask a Macwhyte distributor or write direct to Macwhyte Company for suggestions and recommendations.

MACWHYTE COMPANY, 2912 Fourteenth Avenue, Kenosha, Wisconsin. Manufacturers of Internally Lubricated Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal and Stainless Steel Wire Rope. Our distributors and mill depots throughout the U.S.A. and other countries carry stocks for immediate delivery. Catalog on request. Mill Depots: New York · Pittsburgh · Chicago · Minneapolis · Fort Worth · Portland · Seattle · San Francisco · Los Angeles

FURNACE PROBLEMS
are Frequently Solved

by REMMEY
RM
SEMISILICA BRICKS

When heating furnace roofs, open hearth regenerator roofs and hot blast stoves are operating in the temperature range of 2200F.-2700F. for sufficient time to cause "First Quality Clay Bricks" to spall and vitrify or sag—and where the performance of silica bricks is hindered by shutdowns and severe temperature changes, a need is created for REMMEY RM Semisilica bricks.

If your furnace problem falls in this category, Semisilica bricks are the answer . . . specify REMMEY RM Brand SEMISILICAS.

REMMEY

Dependable Refractories

RICHARD C. REMMEY SON CO.
Philadelphia 37, Pennsylvania

Behind the Scenes . . .

NIAA Series Starts in STEEL

"Why is it that some salesmen never meet a stranger?" Geraldine stood accusingly in the doorway to our office as she asked the question. Our night editor who doubles as a cleaning woman for the building had come to work early, we knew, just to button-hole us.

"Don't know, Geraldine."

"I've got the answer right here," she said, fishing in her imitation leather shopping bag, "and some copy for the column."

Geraldine's cleaning duties take her on junkets to all parts of the building. The evening before she had been down in the art department and saw an interesting job in the works there. The question she had asked she had seen on proofs for an advertisement appearing on pages 6 and 7 in this issue.

It's the first of a series STEEL will carry on the benefits of industrial advertising. Copy for this first one was prepared by the Indiana Association of Industrial Advertisers, a chapter of the National Industrial Advertisers Association. Other ads prepared by other chapters of the association will appear in subsequent issues.

Basic Reading

Geraldine also tells us that the art department has still another big job on the fire. That is a layout for a book on the abc's of steelmaking. Chapters of the book have been appearing in STEEL since Dec. 20, 1948, in the "Fundamentals of Steelmaking" series. The 26th chapter, on malleable castings, ran June 5. The first chapter was on the production of electric arc furnace steel.

The book is scheduled for publica tion in the early fall.

If you don't want to wait for the book, you can get reprints of previous individual chapters from Readers' Service Department, Penton Bldg., Cleveland 13, O. Prices range from 20 to 75 cents per reprint.

As of June 8 when the last count was taken, 41,918 reprints of the series had been distributed.

Expensive Vocabulary

We read in the papers that Judge Bennett Champ Clark of the U. S. Court of Appeals says a woman should get $10,000 for "loss of consortium."

Since we didn't even k-ow what consortium is, let alone whether its loss is worth $10,000, we followed the case with unusual interest.

"Consortium," says Judge Clark, "although it embraces within its ambit of meaning the wife's material services, also includes love, affection, companionship, sexual relations, etc., all welded into a conceptualistic unity."

We still don't know whether the loss of consortium is worth all that money, but the judge, we've decided, has a $10,000 vocabulary.

Snow Balling in the Summer

We went up to see Associate Editor John Morgan the other day and found him knee-deep in copy paper, metalworking annual reports and cartoon sketches by Pat Dwyer Jr. He was putting some finishing touches on the illustrated depreciation story that appears in this issue on pages 59 and 60.

"This depreciation thing is snowballing," he told us, chewing on a much-gnawed No. 2 pencil. "In the job for this week we're presenting some hot ideas we got from Ernst & Ernst on the need for reform in financial reporting for corporate annual reports."

The article this week is the second one Morgan has done on depreciation. The first appeared May 8. Reprints for both (just a limited number left for the May 8 story) are available from Readers' Service Department, Penton Bldg., Cleveland 13, O.

Puzzle Corner

Charles E. Norton of Highland Park, Ill., was the first in with a correct answer to the pirate problem of June 5. There were 1021 pieces originally.

Charley Jones pays his son, Billy, 8 cents for every problem correctly solved and fines him 5 cents for each incorrect solution. At the end of 26 problems neither owes the other anything. How many problems did Billy solve correctly?

Shrdlu

(Editorial Index—page 47)

Published every Monday by the Penton Publishing Company, Penton Building, Cleveland 13, Ohio. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countires, one year $18. Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879.

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meet a stranger

The answer is advertising. It precedes the salesman on every call, establishing his identity and stating the nature of his business. It saves the salesman's time and the customer's time. It reduces the cost of the call—the cost of the sale.

If yours is a company whose products are sold to industry—where the cold conditions of sale are cost, quality, performance and delivery—advertising can never conceivably replace the salesman. But advertising can be the means of getting that same salesman into the prospect's office—*and out with the order*—in less time and at lower cost than any other method known to management.

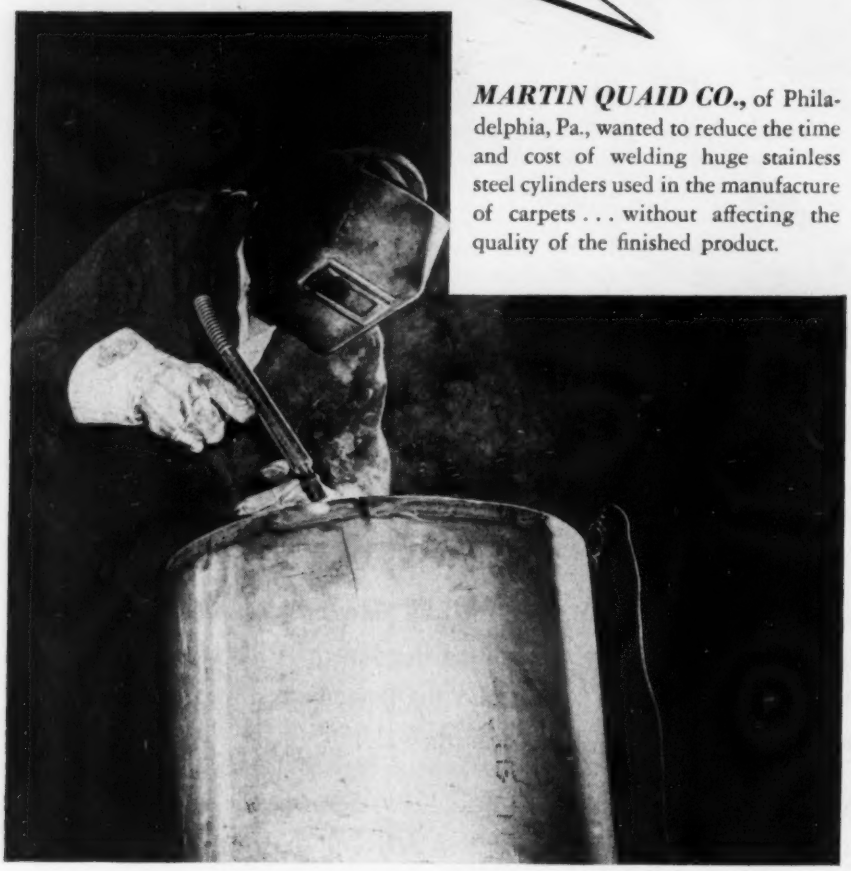
In doing this one job, alone . . . and without taking into consideration its many corollary functions . . . your advertising deserves the best thinking and the best brains your company can command. It is a capital investment in the truest sense of the word . . . an investment made to achieve specific results and to pay a given return. As such it demands your most careful consideration.

INDIANA ASSOCIATION OF INDUSTRIAL ADVERTISERS

A CHAPTER OF THE NATIONAL INDUSTRIAL ADVERTISERS ASSOCIATION

A national organization, comprised of 3,500 members of the 34 local associations of industrial advertising and sales executives—dedicated to greater efficiency in industrial distribution—and lower sales cost.

New Aircomatic® Welding Process cuts materials cost 25% ... saves 4½ hours time



MARTIN QUAID CO., of Philadelphia, Pa., wanted to reduce the time and cost of welding huge stainless steel cylinders used in the manufacture of carpets . . . without affecting the quality of the finished product.

Dana V. Wilcox, Airco Technical Service Specialist, was called in. He recommended the use of Airco's new Aircomatic process. The cylinder to be welded was 13′ 4″ long with an O.D. of 34¾″, and a wall thickness of .093 Type 304 stainless steel. After establishing the wire speed to be used in the Aircomatic process, the weld was performed in a total elapsed time of 1½ hours — 4½ hours faster than the former method used.

The operation consumed 6½ pounds of Airco Type 316 stainless steel wire, and 35 c.f.h. of Airco high quality inert gas — all at 25% below the cost of materials used in the old procedure. The customer was well satisfied and now uses the Aircomatic process for fabricating stainless steel as well as aluminum.

If you are interested in applying the Aircomatic process to a particular aluminum, aluminum or silicon bronze, stainless or nickel clad steel fabrication problem of your own, we will be glad to offer technical assistance. If you would like to receive a descriptive bulletin on Aircomatic welding, please write your nearest Airco office for a copy of ADC-661A.

AIRCO **AIR REDUCTION**

Offices in Principal Cities

TECHNICAL SALES SERVICE — ANOTHER AIRCO PLUS-VALUE FOR CUSTOMERS

LETTERS
TO THE EDITORS

We Recommend—

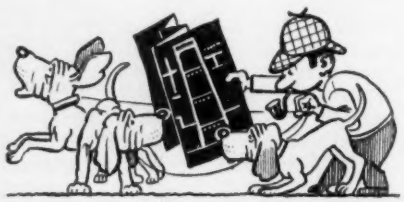
Can you supply a book which will quickly identify mills supplying definite products? For example, terneplate; can you tell us companies producing both long and short ternes regularly?

N. M. Steffens, Director of Purchases
Geuder, Paeschke & Frey Co., Milwaukee, Wis.

• *Your best source is STEEL. The price section carries 3223 separate price entries weekly. Each price is keyed to producer and point of origin.*

Smokestack of Armco Iron

One of our customers wants us to quote him on a smokestack to be built of 3/16-inch Armco iron. It has been 12 years or more since we used any of



this material; so far we have been unable to locate any. Any information will be appreciated.

A. M. Honrine, Secretary
Riverside Iron Works, New Bern, N. C.

• *This steel is in extremely short supply. Mills producing it are booked solidly through the third quarter of this year and some into the fourth quarter. It is suggested you contact a district warehouse or broker, or write to Armco Steel Corp., Middletown, O.*

Rail or Truck?

In "Cheaper by the Big Carload" (May 1, p. 57), you cite savings to steel consumers under new rail freight rates.

How does this work out when you have to take into consideration the cost of trucking steel from railroad station to manufacturer's plant? That cost is eliminated when entire shipment moves from mill to customer's plant by truck.

P. N. Dann, President
Rattan Mfg. Co., New Haven, Conn.

• *Good point! Our example assumed rail siding to buyer's plant. If rail terminal to plant trucking is necessary, it may be cheaper to haul entirely by truck. Note new truck rate setup (STEEL, June 12, p. 61).*

Prepolishing

We read with interest your article "prepolishing" before forming and wonder if you can tell us the type and who makes the water soluble, heat setting film used on steel previous to machining operations.

C. J. Engstrom, Plant Manager
Royal Metal Mfg. Co., Michigan City, Ind.

• *Northwest Chemical Co., 9310 Roselawn, Detroit 4, Mich., and H. A. Montgomery Co., 17191 Swift, Detroit 3, Mich., make the coating material.*

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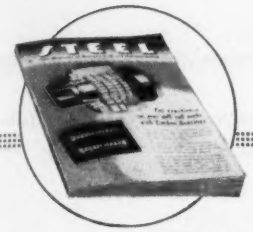

June 19, 1950

Don't Fool Yourself!

Few executives of industrial corporations realize the extent to which their profit and loss statements and balance sheets are distorted by variations in the purchasing power of the nation's currency. Today a great majority of the financial statements issued by companies in the metalworking industries make no allowance for the fact that plant assets are valued at a hodge-podge of 50, 75 and 100-cent dollars.

This is bad from several standpoints. First, it fails to inform management and stockholders of the extent to which invested capital is diluted by "water of the dollar." Secondly, it gives labor union opportunists an undeserved chance to capitalize on what they can claim to be "exorbitant profits." Thirdly, it confuses the American public as to the true magnitude of the earnings of industry. All in all, industry's ineptitude in reflecting the impact of changing dollar values in its financial statements has been one of its major errors in public and labor relations.

Fortunately this bungling can be corrected by a rather simple procedure. All that is required is a proper adjustment in financial statements for the variable of dollar value. Corporations can continue to supply the conventional financial data to the Bureau of Internal Revenue which it requires but to employees, stockholders and the public it should submit an adjusted type of profit and loss statement and balance sheet which reflects realistically the true status of the company's affairs.

This involves the use of a reliable index of the changing value of the dollar. The cost of living index or the wholesale commodity index of the Department of Labor's Bureau of Labor Statistics or modifications of them would suffice. Use the appropriate index to establish the value of physical assets in the year you acquired them and to determine the correct provision for depreciation. When you do this you will have some new entries on the liability side of your balance sheet which will go a long way in dissipating the erroneous impressions gained from the unrealistic, orthodox financial statements of the recent past.

To corporation executives concerned with this important problem, we recommend a careful reading of the discussion of depreciation beginning on page 59 of this issue.

* * *

SEE REVIVAL IN COAL: So much has been said about the sad plight of the American coal industry that it is refreshing to find that makers of coal mining and handling equipment are distinctly optimistic.

Their confidence is based upon these factors: 1. Coal is still the most widely used fuel in America. 2. By 1965 the nation's fuel energy needs will be up 25 per cent from those of 1947. Coal will share in this increased demand. 3. Known coal reserves are vastly greater than those of oil or gas. 4. To compete with oil and gas, coal men must keep costs down. 5. A "survival of the fittest" evolution is going on in the coal industry. The 8700 commercial size mines in 1947 may fall to 2000 in 1960. The surviving mining companies will be bigger, stronger financially and more interested in mechanization. 6. After a poor year in 1949, due to coal strikes, coal machinery sales are reviving.

Salvation of the industry lies to a large extent in mechanization. It is estimated that the mine of the future will produce 30 tons of coal per man-day. This is more than four times the av-

(OVER)

erage of 6½ to 7 tons per man-day achieved currently.

An increase in efficiency of this magnitude would revolutionize the industry. If timed appropriately, it could become the factor that would rescue coal from the threat of nationalization. —p. 66

* * *

TOO GOOD TO LAST?: Weekly output of automobiles and trucks in the United States and Canada has totaled 200,000 or more in two consecutive weeks. At this rate assemblies in June could easily exceed 800,000. This would shatter May's record-breaking 700,000 sensationally.

Such spectacular production naturally arouses the uneasy feeling in some quarters that "things are just too good to last." Yet no one in authority has warned of an early collapse. On the contrary, Harry Klinger, general manager of Pontiac, predicts heavy demand will continue through 1950 and into 1951. His reasons: 1. Continued existence of unsatisfied demand resulting from war shortages. 2. Replacements of early postwar cars. 3. Eleven million cars now in use are at least 10 years old. 4. Number of persons able to buy new cars has increased 35 per cent since prewar period. 5. Population shift from cities to suburbs has increased need for cars and swelled number of two-car families. —p. 69

* * *

CHUCK OUT ODD SIZES: In this space last week mention was made of the fact that standardization is General Motor's No. 1 weapon against high manufacturing costs. Last week at the annual meeting of the National Association of Purchasing Agents in Cleveland a spokesman for another large corporation emphasized the cost-cutting possibilities of standardization.

He is Thomas D. Jolly, vice president of Aluminum Co. of America and president of American Standards Association. He outlined how Alcoa reduced its inventories of special cutters for machining dies from 57 to 28 types. Buying each type in larger quanties is saving the company $10,000 a year on these tools alone.

Opportunities to cut costs by eliminating odd sizes and nonstandard items are not confined to the industrial "giants." In one Alcoa plant 1070 items were eliminated through standardization of only 15 classifications of stores. Check your storehouse! You will find scores of items you don't need and you will save money by simplifying your range of varieties. —p. 56

* * *

INDUSTRY CALLS BLUFF: Representative Frank Buchanan, chairman of the House Select Committee on Lobbying, sent a long questionnaire to 166 large industrial corporations. He asked for a detailed breakdown of the money spent by these corporations from Jan. 1, 1947, to date on trips to Washington, maintenance of Washington offices, cost of printing circulars and advertising pertaining to public issues, contributions to tax-exempt and propaganda organizations and expenditures relating to "any attempt to influence . . . the passage or defeat of any federal legislation."

Coming on the heels of numerous senseless inquiries from other "investigating" committees, the Buchanan questionnaire was inquisitorial enough to make the worm turn. Many corporations replied in blistering language. President Clarence B. Randall of Inland Steel wrote " . . . . you have demanded . . . information to which you are not entitled in a free America. . . . Unless our present doubts as to your authority to ask these questions are satisfactorily cleared, we shall make no further answer to your questionnaire." —p. 57

* * *

MUST PAY THE PIPER: Creeping inflation is placing many industrial companies in an uncomfortable position. They don't want to increase prices but conditions beyond their control may force their hands against their will.

William E. Umstattd, president of Timken Roller Bearing Co., states his company's typical predicament with commendable frankness. In the last three months production costs of its No. 4620 nickel molybdenum alloy steel have risen $18.20 per ton. Scrap has mounted from $35 to $50 per ton. Nickel also is higher. As a result, the company is seriously considering an increase in the price of its alloy steels. If this becomes necessary, prices of roller bearings also will have to be increased.

You can't beat the cold arithmetic of real costs. If we as a nation persist in feeding the flames of inflation, we must resign ourselves to its disagreeable consequences. —pp. 57, 137

E. L. Shaner

EDITOR-IN-CHIEF

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News Summary

NO BUY-BUY BLUES—Purchasing agents were optimistic—with reservations—about future business prospects at their Cleveland convention last week. The men who have to be right about the future most of the time—if they aren't, they won't be buyers long—ask these questions: How much of the present boom stems from demand postponed by steel and coal strikes? How much can be counted on as new and sustained demand? The tremendous expansion in credit is one of the most dangerous features of the present situation, believes Dr. Edwin G. Nourse, former administration economic adviser (p. 55).

ONWARD AND UPWARD—Some producers and sellers participating in the present boom are a little uneasy—they remember 1929—but the average executive in the manufacturing and sales end of business is bullish about the outlook. He's that way because this boom has stamina (pp. 72-75). STEEL's production index keeps climbing; for the week ended June 10 it soared to 215. Steelmakers have been operating at or above practical capacity for nine consecutive weeks. Industry's expenditures for new plants and equipment are climbing. Auto and truck production (p. 69) is at the unprecedented pace of 200,000 a week.

HODGE-PODGE DOLLARS—A mixture of 50, 75 and 100-cent dollars can play hob with your company's balance sheet and cause you to overstate your profits (pp. 59-60). Another study by STEEL on the need for depreciation reform—the first ran May 8—shows that inadequate provisions for depreciation will pad your profits. Industry needs a means to get factual financial reporting. Balance sheets with depreciation and plant asset provisions adjusted to the changing value of the dollar may eventually show Congress the unfairness of present federal tax treatment of depreciation. Before industry can get tax reform, it may have to modify its own accounting techniques.

TRAVEL BROADENS—Government men going to Torquay, England, this fall hope to help American machine tool builders (p. 62). They want to get tariff concessions on machine tools at a trade agreement session there. Our domestic builders are threatened now on their home ground by foreign makers who take advantage of our low duty of 15 per cent. At the same time, American tool exports are throttled by tariffs in foreign countries that are as high as 65 per cent of the value of the machine.

SLUGGING BACK— How much did you tip the waiter in a railroad dining car when you were on a trip to Washington back in January, 1947? Details nearly that minute were asked of 166 companies by Chairman Frank Buchanan of a House Committee investigating lobbying (p. 57). President Clarence Randall of Inland Steel said he would not give the data asked for in the "inquisitorial" questionnaire.

BLACK GOLD— Business looks good to makers of coal mining and handling equipment despite the coal industry's debatable economic prospects (p. 66). The uncertain health of coal is one of the very reasons why machinery makers are optimistic. To get on a better competitive footing, coal mine owners must mechanize more.

THE PRICE OF STEEL— Timken Roller Bearing Co. may have to raise its alloy steel prices because of the increased cost of scrap and other raw materials, including nickel (p. 57). For the scrap grades it uses, Timken is now paying $50 to $52 per ton, compared with $35 three months ago. Roller bearing prices may also have to be raised.

HERE AND THERE IN INDUSTRY— Aluminum Co. of America is cutting costs by standardizing (p. 56) . . . Britain has given a point-blank refusal to the French proposal for a coal-steel pool (p. 61) . . . Iranians want to get a steel mill going (p. 61) . . . The first American ironworks, near Boston, is being restored (p. 67) . . . Signs of the Times: Radio Manufacturers Association will change its name to Radio-Television Manufacturers Association (p. 58) . . . The steel industry poured a record 8,549,038 tons of ingots in May (p. 56).

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Let's Go Fishing

Big bass flashing through your fancy lately? Been hankering for cool pine groves . . . or the feel of rolling fairways underfoot?

Yes, it's vacation time again! And if you're planning a holiday, here's a suggestion that may help to keep things running smoothly while you're away.

Call Ryerson now for quick delivery of the steels likely to be needed before you return. And tell the men who carry on to get in touch with Ryerson for whatever steel they need.

You can depend on us to work closely with you and your men—to give prompt, personal attention to every requirement. So take a breather—forget the shop—and enjoy your vacation to the full.

PRINCIPAL PRODUCTS

CARBON STEEL BARS—Hot rolled & cold finished

ALLOYS—Hot rolled, cold finished, heat treated

STRUCTURALS—Channels, angles, beams, etc.

STAINLESS—Allegheny bars, plates, sheets, tubes, etc.

PLATES—Many types including Inland 4-Way Safety Plate

REINFORCING—Bars & Accessories, spirals, wire mesh

SHEETS—Hot and cold rolled, many types & coatings

BABBITT—Glyco bearing metal, also Ryertex plastic bearings

TUBING—Seamless & welded, mechanical & boiler tubes

MACHINERY & TOOLS—For metal fabrication

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO

STEEL
A PENTON PUBLICATION

P.A.s Are Optimistic but Cautious

Bulk of industrial buyers see good business through the year but they're not inclined to stockpile in anticipation of future scarcities or price increases

IF YOU want to know how business is, ask the seller. If you want to know how business is going to be, ask the buyer; his plans and the plans of thousands like him shape the future.

Like the augurs of ancient Rome, the nation's P.A.s tried to foretell a little of the future when they got together in Cleveland last week. Since they have their fingers on the pulse of general industry probably more constantly than anyone else in their firms, they were worth listening to.

Optimistic, But Cautious — As a whole, purchasing agents today are optimistic over the business outlook but are showing signs of increased caution. That was evident at the 35th annual international convention.

R. C. Swanton, director of purchases, Winchester Repeating Arms Co., New Haven, Conn., and chairman of the NAPA Business Survey Committee which issues monthly reports on the business outlook as seen by industrial buyers, reports these opinions of industrial buyers:

1. Fifty-three per cent see good business to the end of 1950, following a midyear leveling off, but even after the leveling off the volume will exceed that of the last half of 1949.

2. Twenty-three per cent look for continuing good business through the third quarter only, with a dropping off in the fourth quarter.

3. Seventeen percent would not hazard an opinion beyond July, and 7 per cent would not go beyond June. These short-range views came predominantly from soft goods industries.

Watching Their Step — Those figures indicate the bulk of the P. A.'s expect pretty good business for the near-term, but because they also look for a leveling off they are being increasingly cautious in making commitments.

Why do they look for a leveling off? These are some of the reasons: Expansion of inventories to conform to the higher levels of business and industrial activity is pretty well completed. So, instead of P.A.s buying both for inventory expansion and current production they now are buying principally for current production. Production in July will be lower as that month will see the heaviest industrial vacation close-downs the country has ever experienced.

Influencing the P. A.s to be increasingly cautious are these questions in their minds: How much of the improved business cycle stems from demand postponed by steel and coal strikes? How much can be counted on as new and sustained demand?

When Can I Get Steel?—With metalworking being America's greatest business, the sessions at which the outlook as to availability and prices of steel and nonferrous metals was discussed were popular ones at the purchasing agents' convention. A majority of NAPA's committee on steel thinks the excess of demand over supply will be satisfied by the end of this year and that balance may be reached before that on the heavy products, plates, structurals and bars. Those who did not agree cited the conversion deals being made for the first quarter of 1951 as evidence that many large users and producers expect steel to remain in tight supply well into next year. To support this view, they also point to the continuing high demand for automobiles, housing construction, household appliances and pipe lines, plus the recently rising volume of freight cars, machine tools and other capital equipment.

What To Watch—To get the first clue as to when steel will become in easier supply, watch the automobile and construction industries, advised J. T. Morrison, Baldwin Locomotive Works, Eddystone, Pa., in a steel forum at the convention. "When they drop, steel will be easier to get." The tight steel supply situation in the automotive industry will crest in late August, thinks Nelson J. Gibbins, Motor Wheel Corp., Lansing, Mich., another participant in the forum. "Watch your balance in steel rather than your tonnage," he advises. Get rid of any "cats and dogs" now while you can get a good price out of them, he suggests.

Vulnerable — Although many current industrial production levels are at unprecedented heights there are "many elements of vulnerability" in the present business boom, the purchasing agents were warned by Dr. Edwin G. Nourse, formerly chairman, Council of Economic Advisers.

Dr. Nourse fears that the rate of deficit spending accepted by the executive branch of the government and aggravated in the legislative process may produce an accelerated price rise leading to a runaway boom followed by "a genuine depression and the brutal deflation that comes from sharp contraction of demand due to unemployment and the drying up of active business investment."

Dangerous—The unprecedented expansion in credit is one of the most dangerous features of the present situation, Dr. Nourse believes. "We must certainly realize that we cannot count on the maintenance of recent rates of credit expansion indefinitely in the future. Checking the expansion rate or even stabilizing the present high level of consumer credit outstanding would damp the absorptive power of the market, and any move toward the imposition of stricter standards would have still more of a constrictive effect.

Dr. Nourse doesn't have much hope that the government could head off a sharp recession or a depression. "The size of government operations, though large in absolute amounts, is small relative to the magnitude of the economy as a whole. If there were any lack of confidence on the part of the public as to the efficacy of government recovery measures, the withdrawal of public activity and spending could easily equal or be several times the amount of support that could be thrown into the economy by the government within a short time," Dr. Nourse said.

Prescription—In view of the unhappy picture he sees, what does he

Scraping for Scrap

To help ease the tight situation characterizing the scrap market recently, Secretary of Commerce Charles Sawyer ordered an immediate study of the Maritime Commission standby fleet of 2300 merchant vessels to determine which of them should be sold for scrapping.

Liberty ships contain an average of 3340 tons of scrap and Victory ships 4600 tons.

advise? Gird your loins right now, not merely to resist the inflationary practice of deficit spending but, no less, to accept the disinflationary consequences of volume production with top-hole equipment, organization efficiency, and managerial know-how.

Standardize: Economize

Eliminate odd size and nonstandard items from inventory and save money

MAYBE you can cut your costs by eliminating odd sizes and nonstandard items in your inventory.

The Aluminum Co. of America has. For example, it reduced its inventories of special angle cutters for machining dies from 57 types to 28, and then by buying each type in larger quantities and in groups for all the plants it is saving $10,000 a year on these tools alone.

This sort of standardization is being applied to all other items in its inventories, and savings are resulting there too. How Alcoa did it was described at the 35th annual international convention in Cleveland last week of the National Association of Purchasing Agents by Thomas D. Jolly, president, American Standards Association and vice president of Alcoa.

Real Reductions — The company standardized on and cataloged 7051 items since it began scrutinizing its inventories in January, 1946. "When we started this work," he said, "we were stocking over 800 items of lubricants.

"A list of standard lubricants, that was just issued, calls for 120 items. Nine hundred types and sizes of files were reduced to 550. Burr varieties were slashed from 60 to eight, welding rod varieties from more than 100 to 12.

"In only three of Alcoa's plants, this kind of standardization, reduced stores items from 32,001 in June, 1945, to 20,683 in February, 1950.

"If you have a single plant operation, it may be of interest that one of our plants eliminated 1070 items through standardization of only 15 classifications of stores.

How It Helps—In its program Alcoa prepared a catalog of standard stores and identified each item with a stock number. This system, says Mr. Jolly, is helpful in many ways: It is uniform throughout the company; by providing positive identification it is used for stock control, bin markings, requisitions, purchase orders, identification on drawings, and transfer and disposal of surplus. Cataloging of stores is not new, but is not in general use, says he.

Standardization of stores has these advantages, he explains: Less shelf room is required. Work is reduced in purchasing, receiving and stores departments. Training periods for apprentices are shortened, since there are fewer parts to learn. Lower purchase prices are obtained by buying in larger quantities. Capital investment tied up and idle on the shelf is reduced.

Steel Shipment Pattern Shifts

Seasonal influences are reflected in the steel industry's shipments of products in April.

Mill shipments of construction and railroad steel rose that month to the highest levels for the year, while products such as bars and flat-rolled items used by the mass production metalworking plants were down in volume from the preceding month.

Total mill shipments at 5,780,453 net tons in April were slightly above the March output of 5,723,340 tons.

An American Iron & Steel Institute report for April shows construction products reaching their highest point that month for the year were: Structural shapes, 333,214 tons; reinforcing bars, 121,858 tons; steel piling, 26,834 tons; and standard pipe, 218,784 tons. On the other hand, shipments of nails and staples at 70,309 tons were lower than in any other month this year.

All railroad products—rails, joint bars, tie plates, track spikes, wheels and axles—were at their highest levels for the year. Increase in shipments of wheels and axles reflects a pick-up in railroad freight car building.

With steel ingot production at or near 100 per cent of capacity most of the year thus far, the seasonal upturn in shipments to the construction and railroad industries could be made only by reducing tonnages going to other industries. As a result, April shipments were down from those of March on these products: Hot-rolled bars, plates, hot-rolled sheets, cold-rolled sheets, galvanized sheets, hot-rolled strip, cold-rolled strip, and drawn wire.

Cold-rolled sheets continue to lead all other products. In April they comprised 12.9 per cent of all tonnage, or 747,072 tons.

Electroplating Getting Better

Brighter and better electroplating of metal surfaces is being developed steadily and at the same time polishing and buffing costs are being reduced.

That was brought out at the 37th annual convention of the American Electroplaters' Society last week at Boston.

Particular attention was given to new methods of smoothing surfaces before and during plating. Employed are new mechanical practice with recently developed chemical and electrochemical methods.

Willian J. Neill, Columbus, O., is the new president of the organization.

May's Steel Output Sets Alltime Record

MORE steel poured out of steelmaking furnaces in May than in any other month in history, reports the American Iron & Steel Institute.

Here's how May's record total of 8,549,038 tons of steel for ingots and castings compares with other months:

Betters April's output by 336,000 tons.

Exceeds the May, 1949, total by 950,000 tons.

Breaks the old record set in March, 1949, by 147,000 tons.

Although the steelmaking furnaces' output exceeded 8 million tons in both April and May, production in the first five months this year, totaling 38,972,363 tons, is about 516,000 tons below the corresponding period a year ago.

The coal strike in the early part of this year is responsible for the deficit.

Steelmaking furnaces were operated at an average of 101.2 per cent of capacity during May, compared with 100.4 per cent of capacity in April and 93 per cent of capacity in May, 1949.

	—Open-hearth—		——Bessemer——		——Electric——		——Total——		Calculated	No.
Period 1950	Net Tons	% Capac.	Net Tons	% Capac.	Net Tons	% Capac.	Net Tons	% Capac.	Net Tons Weekly	weeks in mo.
Jan.	7,131,519	96.5	379,252	80.6	419,601	71.9	7,930,372	93.9	1,790,152	4.43
Feb.	6,142,178	92.0	255,565	60.2	395,502	75.0	6,793,245	89.1	1,698,311	4.00
Mar.	6,747,680	91.3	265,726	56.5	473,630	81.1	7,487,036	88.7	1,690,076	4.43
1st Qtr. .	20,021,377	93.3	900,543	65.9	1,288,733	76.0	22,210,653	90.6	1,727,111	12.86
*Apr.	7,314,733	102.2	407,909	89.5	490,030	86.7	8,212,672	100.4	1,914,376	4.29
†May	7,595,052	102.8	437,006	92.9	516,980	88.6	8,549,038	101.2	1,929,805	4.43

Note—The percentages of capacity operated are calculated on weekly capacities of 1,668,287 net tons open hearth, 106,195 net tons bessemer and 131,786 net tons electric ingots and steel for castings, total 1,906,268 net tons; based on annual capacities as of January 1, 1950 as follows: Open hearth 86,984,490 net tons, bessemer 5,537,000 net tons, electric 6,871,310 net tons, total 99,392,800 net tons.
* Revised. † Preliminary figures, subject to revision.

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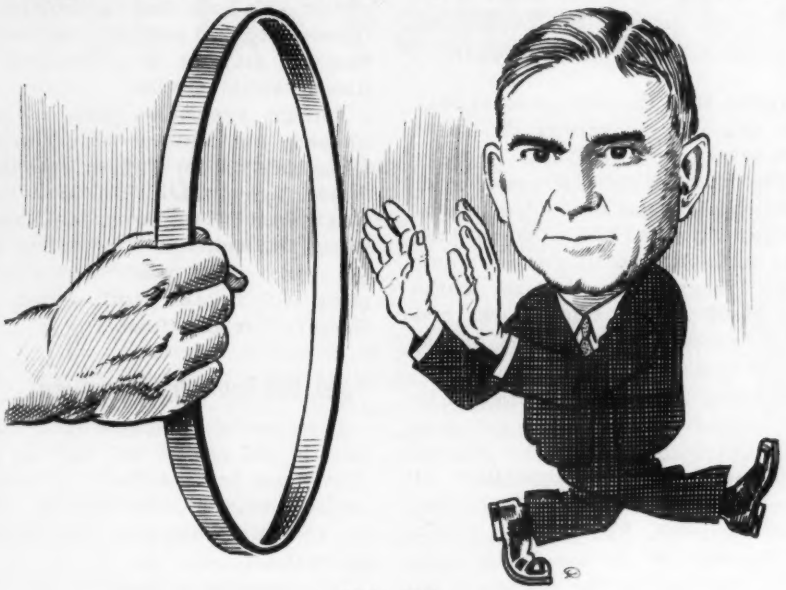
Congressman's Inquisition Gets Industry Dander Up



Unh—Unh

CLARENCE B. RANDALL, president of Inland Steel Co., won't jump through Rep. Frank Buchanan's hoop.

The Democrat from Pennsylvania and chairman of the House Select Committee on Lobbying sent a questionnaire to 166 companies—Inland among them—asking for minutiae on Washington trips taken at company expense since Jan. 1, 1947. Mr. Buchanan sent out the questionnaire on his own responsibility, without authorization by the committee.

Hornets' Nest—The response he's getting reflects the new "slugging back" attitude taken by industry toward government attacks. U. S. Steel Corp.'s President Ben Fairless in a Baltimore speech was one of the first to hit back at "congressional inquisitions" (STEEL, May 1, p. 59). The new attitude got support at the American Iron & Steel Institute meeting (STEEL, May 29, p. 29).

Among the many details Mr. Buchanan wants are: Date of every trip, total expenses paid by the company, name and title of the person making the trip, cost (including salaries) of maintaining a Washington office regardless of its purpose, cost of printing and distributing material dealing with public issues and contributions to organizations concerned with public issues.

The Retort Direct—Here's what Mr. Randall wrote to Mr. Buchanan after he had received the legislator's inquiries:

"By your inquisitorial letter, you have demanded of the Inland Steel Co. a great deal of information to which you are not entitled in a free America.

"You have asked, for example, whether any of our executives have been to Washington to discuss public matters.

"I will give you an example.

"As president of Inland I recently went to Washington for the express purpose of discussing a public matter with the senator from Illinois, Paul H. Douglas, for whom I have great respect.

"What I said to him is strictly my affair, and I shall not account for it to any other member of Congress. Nor shall I tell you how much I spent for my dinner on the train going down. And if I wish to go once more to Washington to see Senator Douglas, I shall not ask your permission.

"You may be assured, therefore, that unless our present doubts as to your authority to ask these questions are satisfactorily cleared, we shall make no further answer to your questionnaire."

Timken May Raise Prices

Rising costs prompt company to consider advancing alloy steels and bearings

TIMKEN Roller Bearing Co., Canton, O., is seriously considering an increase in prices of its alloy steels.

Sharp increases in costs of scrap and other raw materials have pushed the company to the point of either operating without a profit or passing along the various costs through price advances, William E. Umstattd, president, told STEEL.

Thinking It Over—Extent of the increases needed or the time when they would have to be applied have not been decided by the company. Mr. Umstattd said, "It's certain, however, that we can't go on forever absorbing such substantial increases in costs."

If higher costs of producing alloy steels continue, the company will have to raise prices of its roller bearings also, he points out.

In the last three months production costs on one of Timken's alloy steels, a nickel molybdenum and steel alloy known as 4620, have risen $18.20, or about 31 per cent per ingot ton, Mr. Umstattd revealed. Timken uses this grade of alloy steel in its own manufacture of tapered roller bearings and also sells it to other companies for production of bearings, gears and other products.

Up and Up—Timken's scrap costs have risen from about $35 a ton three months ago to as high as $50 to $52 a ton for heavy melting and open-hearth grades. It also has to pay more now for nickel.

All of Timken's six electric and three open-hearth furnaces at Canton are producing alloy steel at capacity rates.

Orders for the company's tapered roller bearings are coming in satisfactory volume from all fields, although a slackening from the railroad industry is noted.

PMCO Buys Hammermills

Pettibone Mulliken Corp., Chicago, acquired Hammermills Inc., St. Louis, as a wholly owned subsidiary. Hammermills is the manufacturer of Bulldog hammermills for the mining, paper and pulp, brick and tile, and cement and chemical industries.

Headquarters for Hammermills was moved from St. Louis to the main office and factory of Pettibone Mulliken in Chicago. Hammermills will now have the facilities of PMCO behind it, providing full control over construction and fabrication and the

metallurgical experience needed to furnish properly engineered materials. C. M. Binder, president, and T. A. Oberhellmann, vice president and chief engineer, of Hammermills will continue in the same capacity under PMCO ownership.

'Plastic Surgery' at GE

General Electric Co.'s Taunton, Mass., Plastics Division plant will be subject to a little "plastic surgery" soon.

GE is about to start a $1 million improvement program to make the plant one of the largest plastics operations in the country, says H. M. Brusman, manager of the division. Besides altering exterior sections of the plant, the company will add presses with the newest and fastest controls.

Radio-TV Makers Elect Sprague

Robert C. Sprague, president of Sprague Electric Co., North Adams, Mass., was elected president and chairman of the board of directors of the Radio Manufacturers Association at the 26th annual convention in Chicago. He succeeds R. C. Cosgrove.

RMA members voted to change the name of the organization to Radio-Television Manufacturers Association. The change becomes effective when amendments to RMA's Illinois corporation charter are filed.

Rheem Expands

The maker of barrels and heaters will spend $4,250,000 to develop plants and products

RHEEM Mfg. Co. will spend $4,250,000 this year to expand its plants and develop new products.

The maker of automatic residential water heaters and steel shipping containers will spend $3.5 million of that sum on the Rheemcote process, a new color lithography method for marking brand names, trade marks and other packaging information on 55-gallon drums.

Colorful Expansion — Lithographing, inner roller-coating and fabricating equipment for the Rheemcote process will be installed at the Baltimore, Chicago, Houston and Richmond, Va., plants. Plants at Bayonne, N. J., and South Gate, Calif., will receive the equipment required to fabricate Rheemcote drums. Lithographing apparatus is already installed at the New Orleans plant where the process was developed at a cost of more than $1 million.

One of the key product developments is production of a new line of residential gas heating equipment. That entails enlargement of the Chicago plant.

Under Wraps—Extended research in gas water heaters receives a share of the expansion budget. R. S. Rheem, president, says one major phase of this research is nearing completion. He hints that "a remarkable improvement in popular-price water heaters" may be in production at Rheem within a year.

Foreign expansion plans of the company are confined largely to establishment of an English associate, Rheem Lysaght Ltd., Bristol, 40 per cent owned by the American Rheem firm. Production is expected to begin early next year. The Bristol plant will be the tenth owned by Rheem's foreign affiliates.

Tool, Die Industry Surveyed

Data needed for mobilization planning in the special tool and die industry are being collected in a national survey by the National Tool & Die Manufacturers Association, Cleveland.

The association is asking contract shops for information about their products and services. Such information has never been collected and no government agency has plans for getting it, the association explains.

The survey, says the NTDMA, is being made now as a matter of preparedness, to insure effective utilization of the special tool and die industry, and to avoid the mistakes and difficulties of World War II.

Allis-Chalmers Sells Equipment

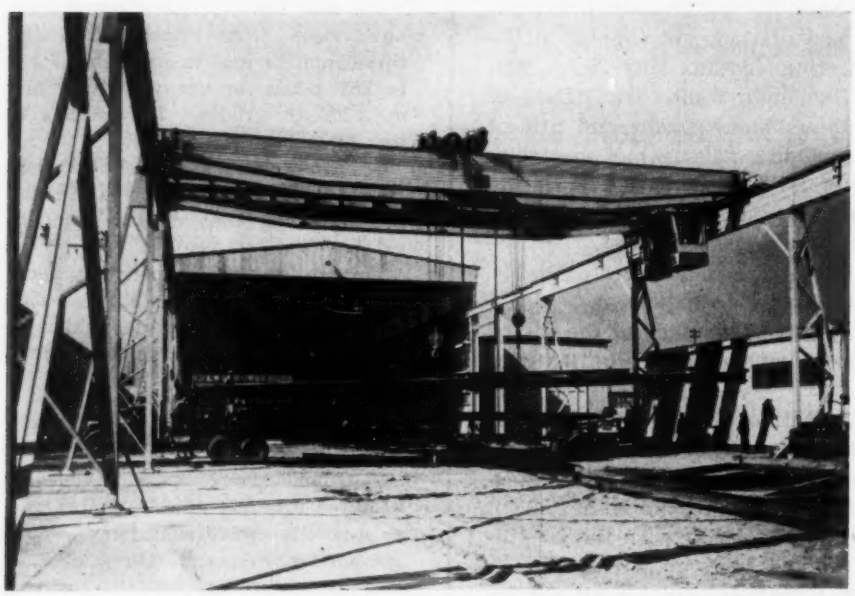
Allis-Chalmers Mfg. Co. announces the sale of its line of sawmill machinery to James A. Hamilton and Ross E. Langill, who have concluded an arrangement with Prescott Co., Menominee, Mich., for manufacture and marketing of the equipment.

The sawmill equipment that will be manufactured and sold by Prescott is the complete line designed and sold by Allis-Chalmers for over 75 years.

Prescott will provide complete service to Allis-Chalmers sawmill customers since it is taking over all patterns, drawings and stock inventory. Allis-Chalmers will continue to serve the industry with electric motors, controls, Texrope V-belt drives and electric power generation, distribution and control equipment as well as logging tractors, road equipment and gasoline power units.

Sheet & Tube Modernizing Mill

Youngstown Sheet & Tube Co.'s electric weld pipe mill at Girard, O., is being modernized and enlarged. The mill, which makes large sizes of steel line pipe, is getting several new bays. Cost of the project was not disclosed.



NORTHWEST TERRITORY: The Structural Steel Division of Pacific Car & Foundry Co., Seattle, is operating at close to 1000 tons a month capacity since completion of its $500,000 addition. New automatic welding machinery, gantry power riveting machines, plate shearing and forming equipment give Pacific Car great diversification in the types of steel work it can handle: Building hoppers, steel tanks, bins, bridges and long-span trusses. The new addition has 90,000 square feet of fabricating area under roof and 2700 feet of craneway. Pacific Car serves a market for steel fabrication and erection in Washington, Oregon, Idaho and Alaska

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Get the Padding Out of Profits

DOES your company's balance sheet really balance? Or is it a hodge-podge of 50, 75 and 100-cent dollars that obscures profit overstatements caused by inadequate depreciation allowances.

CAN you expect Congress to push for reform in tax provisions regarding depreciation when the figures presented in many industrial annual reports don't show the need for reform?

AN ERNST & ERNST executive says reform in accounting procedures is necessary before we can get tax depreciation relief from Congress. He suggests: Give the government statistical proof of the unfairness of present depreciation treatment by submitting to the public a balance sheet that is adjusted for changing price levels.

Golly, Uncle, I'm not as big as I look!

By John S. Morgan
Associate Editor

ONE BRIGHT June morning Bruce Lawson leaned back in his swivel chair and propped his feet on a glass-topped desk. The president of an Ohio metalworking company felt fine even though his union wanted more money and the government had just denied his claim for higher depreciation allowances.

All that was forgotten because he was studying the preliminary balance sheet for his company's fiscal year just ended. An excellent report, it looked like this:

Current Assets		$ 800,000
Plant Assets—Original Cost	$1,000,000	
Less: Allowance for Depreciation	500,000	500,000
TOTAL ASSETS		$1,300,000
Current Liabilities		400,000
Capital Stock		200,000
Earned Surplus		700,000
TOTAL LIABILITIES		$1,300,000

The report that Bruce Lawson is studying doesn't stack up so well if he realizes:

1. It is not an accurate picture of the company's financial condition because it's a hodge-podge of 50, 75 and 100-cent dollars.

2. The Lawson company's profits are grossly overstated, making the firm more than ever a prey to labor demands.

3. The government, too, gets an inflated idea of the earned surplus and taxes accordingly.

One of the most subtle ways hodge-podge dollars can distort your balance sheet is in the depreciation provisions. At the twelfth annual Institute of Accounting meeting at Ohio State University H. T. McAnly, partner in the accounting firm of Ernst & Ernst, said: "Existing practice concerning depreciation operates fairly only when there is no change in the purchasing power of the dollar during the asset's life."

The government's antiquated policy toward depreciation causes many problems (see STEEL, May 8, pp. 53-56, for details), but these three stand out:

1. Inadequate account is taken of inflation.
2. Industry must depreciate over too long a time.
3. The Bureau of Internal Revenue is too slow in its tax audits.

Mr. McAnly is primarily concerned with the first aspect of the problem. He says: "It's the function of accountants to do honest financial reporting. Let's concentrate on that function. If honest and realistic financial reporting indicates clearly that present depreciation deductions are insufficient, Congress may eventually do something about it. Factual reporting must come first. How can we expect Congress to accept the truth of our claims if they are not reflected in our own reporting?"

But how are the Bruce Lawsons of industry to get this factual reporting? Mr. McAnly has a solution.

What we need, he says, is a recognition of the change in the purchasing power of all funds being recovered in depreciation, with the adjustment in the depreciation provision representing a reserve to prevent capital erosion.

Such a method needs an index of the current value of the dollar. Mr. McAnly suggests that our government issue such an index. Perhaps it could be a modification of the Department of Labor's cost of living index or the wholesale commodity index.

The depreciation provisions for the year could be computed on any of the generally accepted bases—the straight-line method, the diminishing balance

method, the production method or any combination of them (see STEEL, May 8, pp. 53-56).

In figuring your depreciation provisions, first tag your assets according to the year you acquired them. The accrued depreciation applicable to the $100,000 worth of machine tools you bought in 1940, the $250,000 factory you purchased that year, etc., should be adjusted for the difference between the index of 1940 and the current index.

Say that your accumulated depreciation on cost at the beginning of 1949 was $500,000, and that the price index was 200. Assuming that the assets you're writing off were all acquired when the index was 100, your deficiency is $500,000. That $500,000 deficiency goes on your balance sheet as a reserve to stop capital

Show the Public There's Water in the Dollar

erosion. At the end of 1949, assume that the index was 300 and that the depreciation provision on cost for the year was $100,000. The index applied to $100,000 gives you $200,000 additional depreciation on the provision for the year. But your total depreciation reserve on cost rises from $500,000 to $600,000. Applying the index on the accumulated depreciation on cost to date, you get $1.2 million added depreciation.

Although you should figure in that $1.2 million in your balance sheet as a reserve to stop capital erosion, Mr. McAnly doubts whether all this would ever be recognized tax-wise as a current deduction item. The sum includes the $200,000 additional depreciation for 1949 as well as for prior years. The best you can hope for is a tax credit for the current year.

When prices fall, the reduction of the deficiency provision applicable to prior years becomes a credit to surplus. The adjustment of the current year's deficiency provision (calling either for a greater or lesser provision) helps determine your income.

Mr. McAnly says you should still depreciate your property until your original cost—ignoring price index changes—has been accounted for. While you are depreciating on original cost without regard for changing price levels, you are also setting up a reserve that does take into account the changing prices. When your original, unadjusted cost has been accounted for, your asset is written off and the amounts figured for your depreciation reserve go to an appropriated surplus to help pay for equipment that now costs more.

All right, so you apply the McAnly method to Lawson's balance sheet. What happens?

Assuming that the current price index is 200 compared with 100 at the time Lawson's company acquired its plant assets, you must set up a reserve to prevent impairment of capital covering the adjustment of the accumulated depreciation, without attempting to adjust balance sheet asset amounts to reflect current price levels. The balance sheet shows:

Current Assets		$ 800,000
Plant Assets—Original Cost	$1,000,000	
Less: Allowance for Depreciation	500,000	500,000
TOTAL ASSETS		$1,300,000
Current Liabilities		$ 400,000
Capital Stock		200,000
Reserve to Prevent Impairment of Capital Covering Accumulated Depreciation		500,000
Earned Surplus		200,000
TOTAL LIABILITIES		$1,300,000

Next, adjust assets and the accumulated reserve. The sheet now shows:

Current Assets		$ 800,000
Plant Assets—Cost at Current Price Level	$2,000,000	
Less: Allowance for Depreciation on Cost at Current Price Level	1,000,000	1,000,000
TOTAL ASSETS		$1,800,000
Current Liabilities		$ 400,000
Unrealized Appreciation-Net Plant Assets		$ 500,000
Capital Stock		200,000
Reserve to Prevent Impairment of Capital Covering Accumulated Depreciation		500,000
Earned Surplus		200,000
TOTAL LIABILITIES		$1,800,000

Says Mr. McAnly: "Unrealized Appreciation is the Excess of the Current Price Level over the Net Cost Investment in plant; it merely reflects the additional capital requirements (not yet realized from income) that will be needed to continue the existing plant at the current cost price levels.

"As the adjusted depreciation to cover price level changes is provided for out of current earnings, and Earned Surplus is adjusted to cover the accumulated depreciation affecting prior years, corresponding amounts should be transferred from the Unrealized Appreciation to the Reserve to Prevent Capital Impairment."

The technique presented here is in condensed form. Mr. McAnly also would adjust inventory accounts to current price levels. Suppose the method really does get rolling as a new accounting technique. What good would it do? The Ernst partner says it would:

1. Show management and stockholders the extent to which invested capital is being impaired by "water of the dollar" unless this decline is offset by reserves accumulated out of income.

2. Make available statistical ammunition to show the unfairness of today's federal tax procedures regarding depreciation allowances. The evidence may force Congress to enact reform.

3. It would give labor and the general public profit figures in line with actual facts.

When this remedy was presented to Mr. Lawson, he said: "Fine, in theory, but how can I use it practically? The tax people would never accept it."

That's true, but there's nothing in the Securities & Exchange Commission regulations that says a company must make the same report corporate-wise as it does tax-wise. Many companies now submit the same report to the Bureau of Internal Revenue as to the public. Mr. McAnly suggests: Why not submit the conventional financial data that the Bureau of Internal Revenue requires, but submit to the public the adjusted type of balance sheet that more clearly shows the true financial condition?

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Britain Shuts the Door

Laborites lock it, too, as they finally give a point-blank refusal to the coal-steel pool

THAT bang you hear is Britain's door slamming on the proposal to join the European coal-steel pool. At least, it is shut as long as the Laborites hold their narrow majority in Parliament. British Conservatives would leave the door ajar.

Behind the Scenes — What does Britain's point-blank refusal mean?

It means that the Franco-German economic alliance still has a good chance for success, but those chances would have been better if the British had made their refusal less definite.

It means that Britain is serving notice that she will not give up her present position as Western Europe's leading steel exporter and producer. Cat-and-dog competition for steel markets will continue.

It means that West Europe's race to expand steel capacities will continue—not on as nationalistic a basis as before, but Britain will be against the continental bloc if and when it is organized.

Between the Lines—The modernization and expansion of steel capacity is the crucial issue that probably dictated so forthright a refusal by British Laborites. In a statement explaining their action they say that "joint planning means nothing unless the industries in each country are required to fit their investment program into a European plan. The Labor party is convinced that nothing less than public ownership can insure this fully."

Besides putting in another dig for their nationalization theories, the Laborites are also saying: "We don't want to lose the competitive benefits of our capital investment program in steel, the most ambitious in Western Europe." The United Kingdom is in the midst of a $1 billion steel expansion and modernization program that should be finished by 1952. When it is completed a five-year program will follow, to cost another $350 million.

The Price Angle—That modernization and expansion has helped keep British steel prices equal to the lowest in Western Europe. British quotations are about equal with German and as much as 20 per cent under French, Benelux and Italian levels. Britain is afraid it would lose that advantage in a steel pool because it would be outweighted and outvoted.

Last year Britain produced about 17.5 million tons of steel. About 31 million tons were produced last year in the continental steel heart that arcs from the Ruhr in West Germany into northern France and is a unit geographically and economically if not politically. Italy produces another 2 million tons or more.

France Turns to Normandy Ore

France has spent about $900 million since the end of the war to expand and modernize her steel plant.

Foundation of her steel expansion is not the Lorraine ore fields, but deposits in Normandy. Exhaustion of the historic Lorraine ore is imminent. A hint that this is so: France won't resume Lorraine ore shipments to Germany. The Normandy deposits are near Caen and contain an estimated 2 billion tons of ore assaying 57 to 58 per cent iron.

Iranians Want To Get Steel Mill Going

How to start an iron and steel industry in Iran (Persia) is among the first batch of technical assistance problems to come before the Commerce Department under the newly authorized Point Four program.

As with all these cases, American industry is invited to render assistance. Anybody having pertinent recommendations about this particular problem of Iran should get in touch with Abbas Zahedi, who can be reached for the present through the Iranian Consulate General, 30 Rockefeller Plaza, New York. He plans to leave for home on or about July 5.

U. N. Invitation—A high official of the "7-Year Plan" organization for the economic development of Iran, Mr. Zahedi came here at the invitation of the United Nations. He spent several months in studying American production methods. A practicing mining and petroleum engineer with headquarters in Teheran, he is a graduate of the Ecole Nationale Superieure des Mines de St. Etienne and the Ecole Nationale Superieure de Petrole de Strasbourg, France.

Contract with Krupp—Before the war, Mr. Zahedi told STEEL, the government placed a contract with the Krupp Works in Germany, for the erection of a coke plant, two 300-ton-per-day blast furnaces and rolling mills at Keredj, west of Teheran.

Foundations were laid but only a part of the equipment was received when the war broke out. The project was stopped, and so far the Iranian government has been unable to arrange to obtain the remainder of the equipment.

Iran is not certain about going ahead with the original plan because the country is short of good coking coal. The Krupp plan was to coke a blend of high-grade coking coal and the low-volatile coals of which Iran has plenty.

Or Nothing At All — What Mr. Zahedi is trying to find is an iron making process using very little coking coal, or none at all. He seeks a process in which ordinary, low-volatile bituminous coal or petroleum can be used as the fuels. He has looked into possibilities of producing iron sponge in rotary kilns but hasn't found anything to meet Iran's conditions. Right now he's seeking information about the Basset and Sturzelberg rotary kiln processes.

If such a process—one that is entirely practical under the conditions of Iran—is not available an alternative is to uncover a method of treating Iran's low-volatile coal so it may be coked economically. If that isn't feasible, the Krupp plan may be carried out and the present facilities completed.

Iran, says Mr. Zahedi, has plenty of iron ore in the locality of Semnan, east of Teheran; it ranges all the way from 41 to 67 per cent iron.

The products which Iran seeks to produce are those needed to support a potentially substantial home metalworking industry — pig iron and sheets, bars, plates, rails, structural shapes, tubing, wire and nails.

ABBAS ZAHEDI
. . . a steel mill for Iran

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Foreign machine tool builders will take over a good deal of our domestic machine tool market unless something is done at Torquay, England, this summer

THOUGH they're not saying so publicly, some government men headed for Torquay, England, this fall to negotiate new trade agreements are confident they'll bring home some good news for the machine tool industry.

They think that by intelligent use of the tariff concessions they are prepared to make with countries outside the Russian orbit they can repeat on a wider scale an experience they had at Annecy, France, last summer.

Back with the Bacon—It was then that the Italians went to Annecy to plump for a flat 35 per cent ad valorem import duty on all machine tools. When the Americans finished bargaining, the Italians had agreed to set import tariffs on various types of machine tools at 7 to 17 per cent.

If our machine tool industry is to stay healthy for a national emergency, the government men realize, something has to be done for it. And the Torquay conference gives it a chance to arrange for selling more American tools in the foreign trade. The government men realize that foreign machine tool manufacturers are threatening to take over a large part of our domestic market in the next few years. At the same time Americans are barred from the important countries by embargoes and prohibitive tariffs.

All Seems Wrong Somehow—L. D. McDonald, vice president of Warner & Swasey Co., Cleveland, had something to say about the situation when he appeared before the Metals & Manufacturers panel of the Committee for Reciprocity Information. Says Mr. McDonald, who appeared on behalf of the National Machine Tool Builders Association:

On the one hand, English, German, French and Italian machine tool builders have rebuilt too far above their prewar capacity. Governments in these countries are charging tariffs up to 65 per cent and in many cases banning imports of machine tools like the ones made in their own plants. That removes our biggest foreign outlets for standard machine tools and confines our sales to special-purpose and high-production machinery that the foreign builders do not make. It certainly doesn't seem right, then, for our builders to pay tariffs, say from 40 to 65 per cent, on tools purchased through the Economic Cooperation Administration with American taxpayers' money.

On the other hand, he continues, because our duty is only 15 per cent ad valorem, the British right now can deliver standard universal machine tools, duty paid New York, at exactly 50 per cent of the prices American manufacturers must charge because of the big differential in wages between the U. S. and England.

Many foreign tools, thinks Mr. McDonald, are exact copies of American tools except for the name plates. "They even copy our mistakes."

Slight Reminder—Don't forget, he adds, when American machine tool builders are prevented from doing business abroad they lose touch with conditions there — and that is bad from the security point of view. In World War II the knowledge about European industrial capacities that was placed at the disposal of the armed services by American machine tool builders was an important safeguard against tactical mistakes.

Besides his public testimony, Mr. McDonald submitted confidential reports on each country—covering machine tool manufacturing capacity, import duties and barriers, etc. Government negotiators will study these carefully for use at Torquay.

What the negotiators will bring back from Torquay the government men cannot say. But they will enter the negotiations with the conviction that duties higher than 15 per cent tend to restrict trade to an undesirable extent.

Scientific Listening Posts?

If recommendations made by Dr. Lloyd V. Berkner are adopted, the State Department will establish scientific and technological listening posts in Johannesburg, Rio de Janeiro, Sydney or Canberra, Paris, Rome, Bern, Stockholm, Ottawa, Frankfurt, and Tokyo.

One such unit has been operating in London since 1947. Though manned with only a token staff, it has rendered valuable service in keeping the U. S. informed about foreign progress. The practice is to release these reports to the public at nominal prices through the Commerce Department's Office of Technical Services—except such reports that are withheld from the public for security reasons.

Dr. Berkner, an outstanding government scientist, recommends appointment of a Science Adviser in the State Department, so the scientific aspects of the Point Four, ECA, Military Aid and other programs can be properly considered in dealing with foreign countries. His recommendations endorse and amplify the conclusions by the Hoover commission that expert scientific advice is needed by the State Department.

The Right Men for the Jobs

To prevent unwise removal of top scientists and technical men from their civilian jobs in another war emergency, the National Security Resources Board is compiling a register of such men throughout the country.

James C. O'Brien, of NSRB's Manpower Division, who has supervision over the work, is earmarking the men for the type of service in which their talents and experience can be used to best effect. In some cases it is likely the men would be left where they are, to continue doing work which is essential from an overall point of view. In others they would be called on to take war jobs —but care will be exercised that their assignments would match their abilities. In particular, the armed services will not be permitted to draft these men without adequate review by the NSRB.

Get On Housing Agency List!

Firms seeking opportunities to line up orders for building and construction materials, or equipment, apparatus and supplies used in the construction industry should write to the Housing and Home Finance Agency, Washington 25, asking that agency to add their names to its mailing list.

The agency has taken over the Community Facilities Service, formerly operated by General Service Administration, and thus has the assignment of granting loans to defray

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the initial cost of planning nonfederal public works projects.

At least once a week, and oftentimes daily, the housing agency issues a release detailing the loans granted, the projects which they cover and the estimated construction cost of these projects. Usually these projects involve outlays running from several hundred thousand to several million dollars. Since publications generally do not publicize the lists in full, the only safe recourse for keeping informed about these projects is to scan the HHFA releases.

'E' Labor Areas for May 31

The Labor Department's list of "E" labor market areas—those in which unemployment is 12 per cent or more of the labor force—was reduced by four areas in May. Areas removed included New London-Groton, Conn.; Biddeford-Sanford, Me.; Atlantic City, N. J., Huntington, W. Va.; and Leavenworth, Kans. Added to the list was a small, relatively rural area, Garrett county, Md.

Areas on the "E" list as of May 31: Jasper, Ala.; San Diego, Calif.; Danielson and Meriden, Conn.; Crab Orchard, Mt. Vernon and Cairo, Ill.; Clinton and Terre Haute, Ind.; Washington county, Me.; Cumberland, and Garrett county, Md.; Lawrence, Lowell, New Bedford and Worcester, Mass.; Cheboygan, Muskegon,Upper Peninsula Copper Area, Upper Peninsula Iron Area and Upper Peninsula Lumber Area, Mich.; Utica-Rome, N. Y.; Marietta, Portsmouth and Toledo, O.; Greensburg, Johnstown, Pottsville, Scranton and Wilkes-Barre, Pa.; Providence, R. I.; Knoxville, Tenn.; Park City, Utah; Bennington, Vt.; Martinsburg, W. Va.; Hilo, Honolulu and Wailuku, T. H.

Standardized Bridge Design

Army Engineers completed a standardized bridge design for temporary or permanent construction in beam spans of 20 to 24 feet, pony truss spans of 40 to 200 feet, or as a stiffened suspension bridge with clear span of 160 to 640 feet.

The design permits railroad loadings not in excess of Coopers E-20. The study, "Variable Span Suspension Bridge," is available from Photoduplication Service, Publication Board Project, Library of Congress; Washington 25. The order number is PB 99471. Your check or money order should be enclosed—$13.75 for the photostat form, and $4.50 for microfilm.

Material Search Continues

Search for materials that will stand up to the high temperatures encountered in gas turbines, jet engines, rockets and guided missiles continues one of the main activities of Navy's Bureau of Aeronautics in the field of research. Major contractors in this category, working directly for BuAer, or for Office of Naval Research with BuAer as a participant, are:

Norton Co., Worcester, Mass., conducting research on combinations of metals and ceramics.

Battelle Memorial Institute, Columbus, O., doing basic work on ductile molybdenum-base alloys.

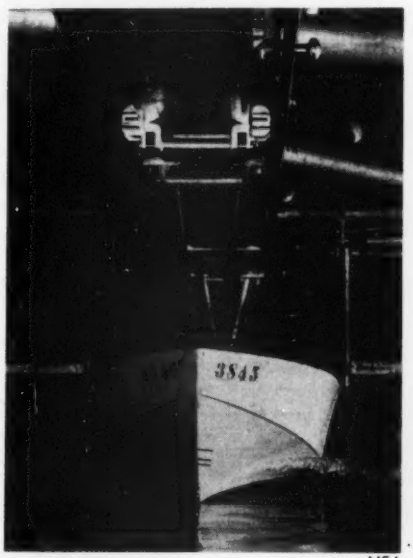
Climax Molybdenum Corp., Detroit, developing molybdenum-base alloys and determining their ability to be forged.

Fansteel Metallurgical Corp., North Chicago, Ill., developing coatings to protect molybdenum-base alloys against high-temperature surface oxidation.

Massachusetts Institute of Technology, Cambridge, Mass., research in chromium-base alloys for high-temperature applications.

Stevens Institute of Technology, Hoboken, N. J., and Rensselaer Polytechnic Institute, Troy, N. Y., research in "sweat cooling" or "transpiration cooling," in which gaseous or liquid coolants are forced continuously through porous structures.

Naval Air Material Center, Philadelphia, testing and evaluating new materials that come on the market, or are developed under BuAer sponsorship, to determine their high-temperature values and their suitability for specific high-temperature applications.



NEA

MODEL BASIN: A naval research laboratory near Washington is the Taylor model basin, used to test scale models of ships and aircraft to determine their effectiveness and durability. It has two very long model basins for testing model ships; two low-speed wind tunnels (speeds up to 180 miles per hour); three other wind tunnels for testing supersonic speeds and other facilities. Here you see the model of a picket boat towed under the carriage in the deep water basin. The method of fastening the model to the dynamometer beam by towing brackets is shown

Over 2000 Patents Offered

Over 2000 patents are offered by Eastman Kodak Co., Rochester, N. Y., for nonexclusive licensing to other companies. They are listed in the Patent Office's *Official Gazette* for June 6.

The patents cover a vast variety of photographic equipment and supplies, including cameras, projectors, screens, spools, reels, lamp voltage controls, motion picture apparatus, electric welding machines for all-metal spools, developing machines, etc.

Lincoln Offering Patents

Lincoln Electric Co., Cleveland, is offering two of its basic patents for nonexclusive licenses. Listed in the Patent Office's *Official Gazette* for June 13, their numbers are 2,402,938 and 2,444,834. The two patents provide high-speed arc welding methods applicable to hand welding or automatic welding machines. Applications for licenses should be addressed to the company, P. O. Box 5758, Cleveland 1.

NSRB Firefighter Appointed

J. E. Frederickson, director of plant protection, General Motors Corp., Detroit, was appointed a member of a National Security Resources Board committee charged with firefighting as a part of civil defense planning.

All of the other members of the committee are fire chiefs and police from various parts of the U. S., representatives of the armed services and officers of fire insurance companies and related organizations.

Blast Slag Booklet for 5 Cents

Preprints of the chapter on Iron Blast Furnace Slag from the Bureau of Mines Mineral Yearbook, 1948, are available at 5 cents per copy from the Superintendent of Documents, Government Printing Office, Washington, 25.

Coal Machinery Makers See Sunshine

To stay healthy the coal industry must keep costs down. And to do that it must mechanize more than ever. After a poor year, machinery sales are reviving

MAKERS of coal mining and handling equipment are optimistic about business prospects despite the coal industry's uncertain economic health. They're confident of the future because:

1. Coal is still the most widely used fuel in America, notwithstanding inroads made by oil and gas.

2. By 1965 the nation's total fuel energy needs will be up an estimated 25 per cent from 1947 when a record 630.6 million tons of bituminous were mined. Not all this gain will accrue to coal, but some of it will.

3. Known coal reserves are vastly greater than those for either oil or gas.

4. To compete with oil and gas, coal men must keep costs down. To keep costs down, they must mechanize more.

5. A "survival of the fittest" evolution is going on within the coal industry itself. Survival is determined partly by the mine's degree of mechanization. The 8700 commercial-size mines in 1947 fell to 8000 in 1948 and may drop to 2000 by 1960. On the surface, that looks like a shrinking market for coal machinery makers. Actually, the survivors will be bigger, more interested in mechanization and better able financially to buy the equipment than many marginal and semimarginal mines still producing.

6. After a poor year in 1949, coal machinery sales are reviving.

The Coal Strike Did It — They could stand some improvement because shipments of mechanical coal-loading equipment for underground use in the U. S. were less in 1949 than in any year since 1935, says the Bureau of Mines. Conveyor sales to the industry were the worst since 1933. Shipments of loaders, scrapers and conveyors were 57.4 per cent under 1948. Mechanical coal-cleaning equipment sales to bituminous mines were 25 per cent lower (measured by capacity). Shuttle car and "mother" conveyor shipments were off 29 and 51 per cent, respectively.

The upturn now is fairly general. It applies to companies that make mining equipment, conveyors, surface cleaning and preparation machinery and equipment for coal-consuming industries and dealers.

See-Saw—William L. Wearly, vice president-coal mining, Joy Mfg. Co., Pittsburgh, says coal mining equipment sales in 1948 were nearly ten times 1939 volume. Sales last year were off about 40 per cent but are expected to recover to about 70 per cent of the 1948 level during the current year.

McNally Pittsburg Mfg. Corp., Pittsburg, Kans., specializing in surface coal preparation plants and equipment for cleaning, crushing, drying, screening and loading, reports that requests for preliminary information on small-tonnage cleaning plants and on stoker coal crushing units both for old and new plants are on the increase. The coal strike's repercussions delayed plans of some potential customers longer than usual.

Looking Up—"We anticipate our sales to the coal industry to reach new highs during coming months," comments Thomas Robins Jr., president, Hewitt-Robins Inc., New York. He states further that there is increased demand for facilities to produce coal properly cleaned and sized. "We are feeling this in our sales of screening and dewatering equipment, in which there has been increasing activity for the last few months."

C. O. Bartlett & Snow Co., Cleveland, manufacturer of equipment for coal users, is enjoying better business now than it has for the last year and a half.

William P. Gruendler, president of Gruendler Crusher & Pulverizer Co., St. Louis, points out that twice as many makers of crushers are in the field now compared with ten years ago. Sales of crushing machinery were 50 per cent lower in 1949 than in 1939, and the trend shows little sign of reversing. One hint of improvement: More coal yards are buying crushers to process the more cheaply handled lump sizes into stoker grades.

Coal Eaters—The most spectacular way to cut costs below-ground is with a continuous mining machine. Its one operation is tantamount to what conventional mining practice does in four: Cutting, drilling, blasting and loading.

Two of these machines were brought to public notice last year—Joy Mfg. Co.'s coal "slicer," and the auger-type "Colmol" built by Colmol Co., a joint enterprise of Sunnyhill Coal Co. and Jeffrey Mfg. Co., Columbus, O.

Bootstrap Improvements—A third machine, kept under wraps until a few weeks ago and which probably will not be available in a production model for three more years, is being developed by the mining industry itself through a special committee of Bituminous Coal Research Inc.

Cost of the development to date has been $258,000, subscribed between 1947 and 1948 by 71 coal, land and railroad companies. A new appropriation goal of $364,000, has been approved by BCR's Mining Development Committee.

Coal Belcher—The machine "bursts" coal out of its seam and can mine seams only 28 inches thick. Rotating arms cut out circles of coal on the face and a "bursting cone" in the center of each circle pushes outward all the coal within this ring. It falls to the floor, is scooped up by a conveyor which spews it out the rear.

The coal mine of the future will get 30 tons of coal per man-day, be-

Soft Coal Goes Mechanized

	Production Net Tons	Men Employed	Net Tons Per Man Per Year	% Cut by Machine†	% Mechanically Loaded†
1891	117,901,238	205,803	573	5.3	
1900	212,316,112	304,375	697	24.9	
1905	315,062,785	460,629	684	32.8	
1910	417,111,142	555,533	751	41.7	
1915	442,624,426	557,456	794	55.3	
1920	568,666,683	639,547	881	60.7	
1925	520,052,741	588,493	884	72.9	1.2
1930	467,526,299	493,202	948	81.0	10.5
1935	372,373,122	462,403	805	84.2	13.5
1940	460,771,500	439,075	1049	88.4	35.4
1945	577,617,327	383,100	1508	90.8	56.1
1947	630,523,722	419,182	1504	90.0	60.7
1948	599,518,000*	435,000*	1378*		64.3
1949	435,000,000*	370,000*	1176*		67.3

† Underground. Bureau of Mines. * Estimated.

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lieves Gerald von Stroh, head of BCR's development group. (Currently 6½-7 tons is achieved.) Three men and one machine will turn out 600 tons a shift at the coal face, for a face labor cost of eight cents per ton.

Another 18 men per machine back of the face will add 50 cents per ton in labor cost. Contrast this 58 cents with today's estimated labor cost of $3.28 for hand loading and $1.64 for machine loading.

Mechanical Joy — Joy's miner — about 70 units are in operation primarily in commercial mines in midwestern states—requires five men to mine 300 tons per shift. A similar tonnage in a modern trackless mine using shuttle car haulage requires an 11-man crew. Sixteen men in a typical mechanized track mine and 50 men in a hand-loading operation are required for the same tonnage. Commercial operators using the machine make savings of between 85 cents and $1 a ton.

During the next two to five years several additional types of continuous miners will appear. Syntron Co. at Homer City, Pa., for one, has such a device under development. Competition between manufacturers and volume production economies may reduce the present price range of $50,000 to $75,000 per unit. When and if mining machines become more common, larger markets will be opened for materials handling equipment to handle the greater tonnages mined.

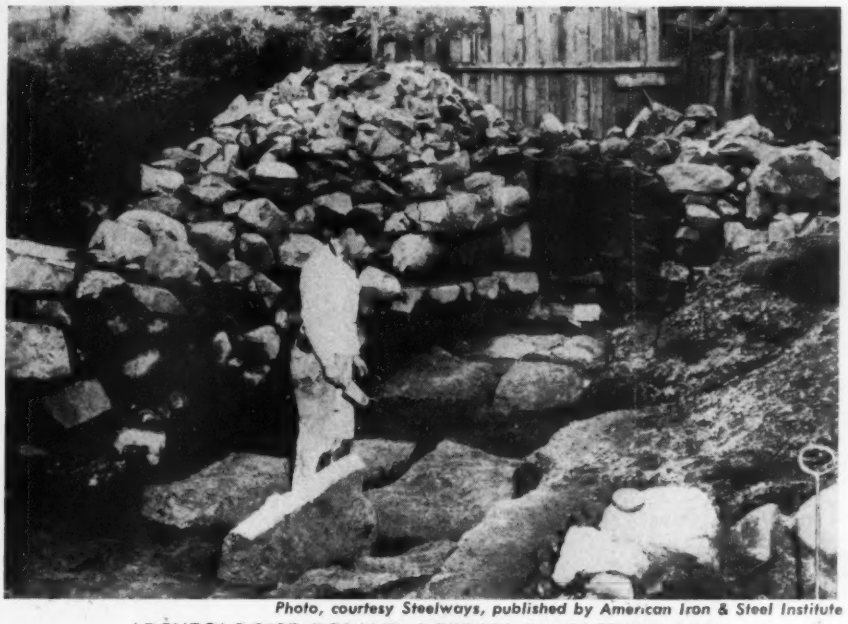
Ceiling Costs — Another below-ground opportunity for cost-trimming lies in roof supports. Mechanized timbering machinery saved one mine 50 per cent of its labor costs for timbering.

Tennessee Coal, Iron & Railroad Co. this month announced that "pinned-up" roof supports—steel plates or channels held up by bolts imbedded in the rock above—have enabled it to eliminate all upright timber supports in more than 5 million square feet of its coal and ore mines.

Above the surface, strip mining equipment is getting larger and makers are devising ways of removing the burden more efficiently.

What Will John Say?—Coal machinery makers are not too worried about the possibility that John L. Lewis will sabotage mining mechanization plans on the theory that it might throw some of his miners out of work.

Up to now, the UMW has welcomed work-saving devices. Some mine operators and equipment manufacturers also cryptically comment: "Mr. Lewis is getting old."



Photo, courtesy Steelways, published by American Iron & Steel Institute

ARCHEOLOGIST ROLAND ROBBINS IN CASTING BED
. . . at his feet in front of the furnace base, an old sow

First American Ironworks Being Restored at Saugus

WHEN the first recorded attempt was made to produce iron in this country, hostile Indians massacred the 150 iron working people and completely destroyed the facilities. That was at Falling Creek near Richmond, Va., in 1623.

The folks who finally succeeded in their attempts at iron production in the American colonies did so on the banks of the little Saugus river about ten miles from Boston. That was in 1643. Today the iron works is being restored as a tribute to the iron workers of colonial days.

Two Tons of Relics — Following clues based on fragmentary records, an archaeological crew already has brought to the surface more than two tons of relics of the iron works. They include: Iron rings, nails, tools and kitchen utensils.

If it had not been for the fierce New England loyalty of Miss M. Louise Hawkes of Saugus whose ancestors lived there as far back as 1630, the historic site might have remained obscure:

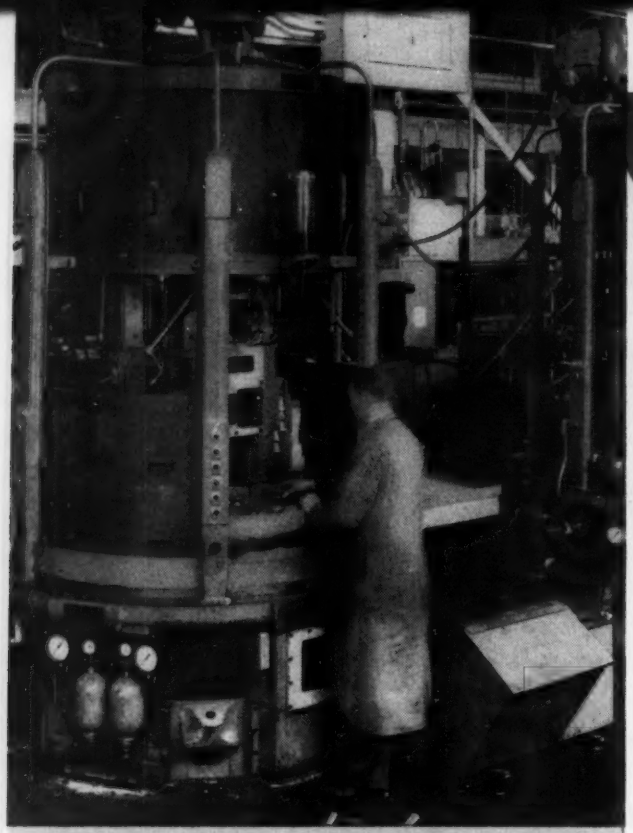
Oldtimes for Henry—In 1942 graduates of the Ford Trade School bought an old house formerly the property of the long-dead Saugus ironmaster. The graduates wanted to move the house to Michigan as a gift to the late Henry Ford. But Miss Hawkes knew the story of the iron works and believed that what belonged to New England should remain there. She carried her fight to keep the house in Saugus to Governor Saltonstall. With the co-operation of Henry Ford himself, the structure was permitted to remain in New England.

The First Iron Works Association was formed in 1943 to carry on the necessary explorations to find all the component parts of the first colonial furnace. Work should be complete by late 1951.

Clamshells, but No Picnic — The working dimensions of the blast furnace were about 22 feet in height and about 9 feet at the bosh. Hearth or crucible (as it was called in colonial times) was a 3-foot affair. The furnace charge consisted of local bog iron ore. Charcoal made from hardwood found in the area was used for fuel. Clamshells and limestone were used for flux. Output was about one ton per day. The blowing power was supplied by a water wheel driving a pair of leather bellows and entered the furnace through a single tuyere at the top of the crucible. Products were castings from open sand and closed clay molds in the form of pots, pans, skillets and other domestic utensils.

The enterprise continued successfully at Saugus for nearly half a century. When all the data on the Saugus site are at hand and authenticated, the work of reconstruction will begin at the original site. All the work is under the direction of Quincy Bent who before his retirement two years ago was vice president in charge of operations of Bethlehem Steel Corp. J. Sanger Attwill of Lynn, Mass., is president of the First Iron Works Association.

Miss Hawkes was elected one of its charter officers.



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83% INCREASE In Production

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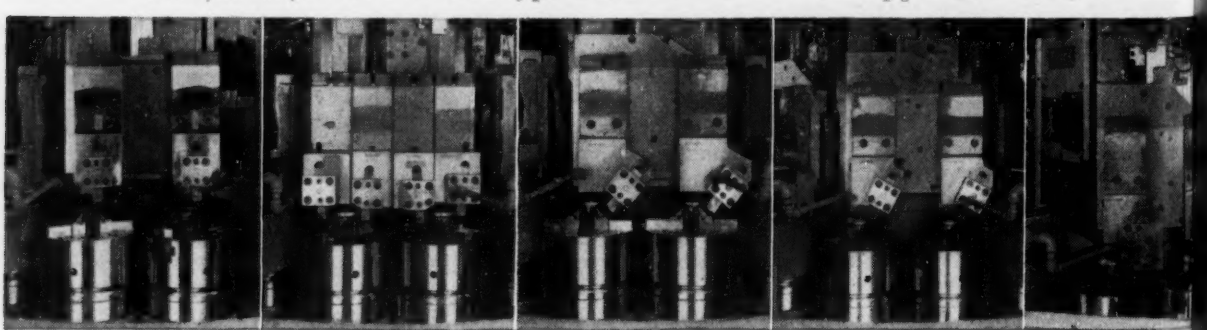
A QUOTATION FROM THE FIELD:

"We were especially impressed on this job with the ease in which the operator was able to load and unload this machine at the rate of 550 pcs. per hour compared with the operator on the 8 spindle double index Type "D" Mult-Au-Matic on the same operation, who was busy trying to produce 30 per hour."

Twin spindles and twin tooling at each station, and each station with its succeeding operations, provides a progressive, high efficient Production Method on Differential Side Gears.

Ask for information on Type "K" Mult-Au-Matic application to your work



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Refinement in design, higher spindle speeds, faster index and in many cases an improved method for 1st and 2nd chucking on the same machine are only some of the factors that place the Type "K" Mult-AU-Matic in a class by itself for Productive Economies.

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By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Some automakers around Detroit are uneasy about the sensational production pace, but Pontiac General Manager Klinger says the demand can last into 1951

DETROIT

YOU can sniff an air of uneasiness here and there around this motor city. Things are just too good to last. Some say they detect the aroma of 1929, even the boys who rushed to buy General Motors common a few weeks ago at around $85 when rumors of the impending stock split began circulating.

They are riding it today at $100 and think it may hit $110 before long. Earnings prospects for this year point to $20 a share which could mean dividends of $12-$15 on the basis of the present stock. Then there were others who jumped aboard Chrysler at around $65, just after the strike was settled. Doing fine today at $80. But every roller coaster eventually starts down.

Who's Buying? — Weekly production has crossed the unprecedented 200,000 cars and trucks, U. S. and Canada, and there is talk of better than 800,000 total for June which makes the record-breaking May total of 700,000 look puny. Who are all the buyers? Every ten-day sales report seems to indicate the pace of deliveries is keeping up with or ahead of the flow from assembly lines. One wag suggests the government is buying up cars and trucks and driving them into the Atlantic Ocean to support the market. That's no more fantastic than the price-support program for agricultural products. Possibly a Senate investigation is in order.

Obviously the industry will not long continue to operate at an annual rate of 9.5 million motor vehicles. The amazing thing is that it has proved physically possible. Still you hear no official warnings of any impending collapse.

Why They're Buying—Quite the opposite. Harry Klingler, Pontiac general manager, says, for example, that heavy demand will continue through this year and into 1951, for five cogent reasons: 1. Continued existence of a substantial volume of unsatisfied demand resulting from war shortages, 2. large replacements of the earliest postwar cars, 3. nearly a third of the 34 million cars now in operation are at least ten years old and have the "aches and pains of old age," 4. population has grown 20 per cent since 1936 and the number of people able to buy new cars has increased 35 per cent compared with prewar, and 5. a great population shift from cities to the suburbs, expanding the need for cars and raising the percentage of two-car families. Beyond 1951 he figures the market depends on the "economic climate."

Whether or not the continuing automotive boom is directly attributable to expenditure of vast billions by the federal and state governments for various groups of the population—and it is easy to subscribe to this belief—the fact remains that motor car builders are turning out the stuff and selling it. That is good for every phase of industry clear back to the iron ore mines.

How the Automakers Stack Up

Take a quick look at some individual company reports.

Nash dealers delivered more than twice as many new cars in May as in the same month a year ago—19,684 units—and for the first five months of the year sales were 40.2 per cent over 1949. And they sold 88 per cent more used cars this year than last.

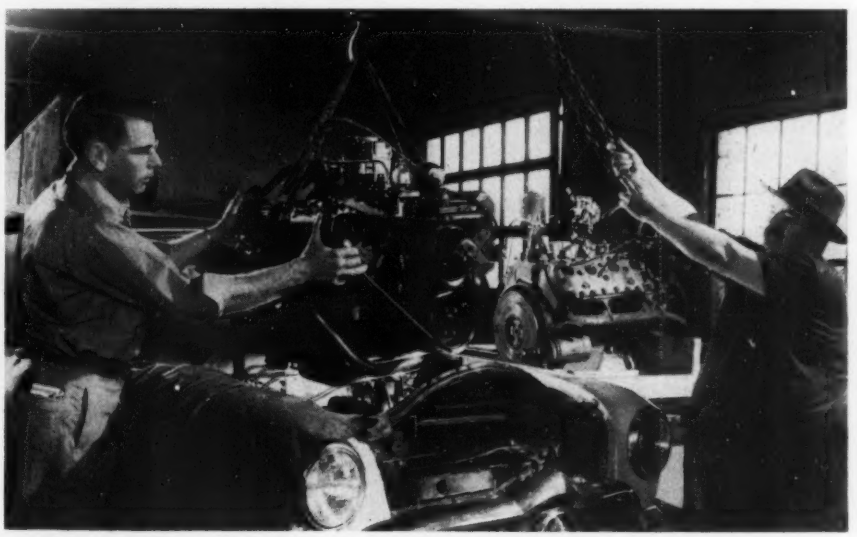
Packard field stocks reached a new low May 31, despite shipments for the month 35 per cent over January. Sales were 8377 in May, 8383 in April, while production was held to about 6300. In a few weeks the last of the 1950 Packard bodies will be shipped by Briggs and most of July will be occupied with a major changeover to the 1951 line which is reported to be one of the most radical design shifts ever programmed by Packard.

Hudson sold 4519 cars in the week ended June 3, or 58 per cent ahead of last year. Shipments in May broke all records, up 27 per cent over a year ago, and drove field stocks down 57 per cent from last year's level at this time. Small wonder a second shift has been added to assembly operations and weekly output boosted 40 per cent to around 4000 units.

Kaiser-Frazer says distribution of its current models has been placed on a strict allocation basis to "cope with heavy retail sales demand." Manufacturing schedules for this month have been shoved up 30 per cent to 16,800, and this involves none of the smaller Henry J. model, slated to get under way in two weeks.

Mercury sold 33,152 cars in May while building 32,051, the latter figure being an alltime record. Thus far in 1950, sales are 95 per cent higher than for the first five months of 1949.

Ford Motor Co.'s overall production of cars and trucks for May reached 176,854, highest since the good old days of August, 1929, when 189,966



HYBRID: Replacing a Ford engine with a Cadillac engine in a standard 1950 Ford are W. L. Williams and Harold Sheldon, originators of what they say is the fastest automobile on the road. Their customers, they say, pay them $1000 and up for the change that enables Fords to hit 60 miles per hour in 8½ seconds

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were rung up. In five months Ford has built 800,800, just double the figure for last year. This does not include 45,000 farm tractors. This is all the more remarkable when it is considered that the basic Ford passenger car lines have been unchanged for two years. Truck sales likewise hold at record levels, May shipments running to 30,680, highest in history.

Chevrolet passenger car production for May was a shade under the record March and April levels, mainly because of the railroad strike and the one-day suspension before Memorial Day. However, truck output set a record at 44,976, making passenger-truck production 160,966. A new daily assembly peak was set May 31, when 8466 units were completed.

Oldsmobile delivered 31,797 cars to customers in May, 22 per cent more than the same month a year ago. This was practically equivalent to the assembly total of 32,116. Prospects are for a six-month total of 200,000 Oldsmobiles, which would call for 42,000 cars this month, or a 33 per cent jump from May.

Cadillac, too, is eating high on the hog, rolling out 9452 cars in May for a new monthly peak, 1600 units over a year ago. Thus far in the 1950 model run, the division has turned out 35,410 and still cannot see daylight through order backlogs.

Admittedly it is difficult to read much pessimism in the foregoing accomplishments and projections yet, as stated before, there is building up the realization that this cannot go on forever and that the turn may be nearer than some of the experts figure.

As yet there has been no scaling back of future materials and parts releases, in fact there have been some supplemental releases from General Motors divisions. Steel supplies appear as tight as ever and no company will admit to having enough stocks. Some standard parts are being marked up about 10 per cent effective July 1, but automotive buyers are accepting the increases as inevitable. Why quibble as long as production roars ahead?

Chrysler Plays It Smart

Forehandedness in building up materials and parts stocks during the strike period is paying off handsome dividends to Chrysler divisions. For 14 weeks suppliers were delivering large volumes of material to scattered warehouse points, so that when the gong rang May 8 the movement of stock to manufacturing and subassembly lines started at once, and in the first 24 hours of production plants turned out 4977 vehicles, building up to the prestrike rate of 7000 by the end of the first week.

Then came the rail strike, and Chrysler traffic and follow-up men enlisted every available truck and moving van to keep stuff rolling, even building temporary roads over railroad sidings so that the railroad loading and unloading docks could be used. Thousands of tons of crushed stone and thousands of feet of lumber were rushed in for this job. It saved the day.

On May 26 daily production hit an alltime high at 8252 cars and trucks and for that week 40,917 units were shipped. The same week 13,000 employees worked seven days, 43,000 more six days and about 23,000 five 9-hour days. Last week assemblies moved up to about 8600 a day, despite the necessity of trimming some 9-hour shifts back to 8 hours because of the refusal of working forces to sustain the longer periods. Overall result is that through last week Chrysler divisions have rushed out approximately 225,000 new cars and trucks since reopening their plants.

Also rushed into production by Chrysler, DeSoto and Dodge are new hard-top convertibles, in the effort to capitalize on the demand which General Motors has been enjoying for this type of styling. Chrysler has the model in three series — Town and Country, New Yorker and Windsor—identifying it as the Newport. DeSoto calls it the Sportsman, Dodge the Diplomat.

Auto, Truck Output

U. S. and Canada

	1950	1949
January	609,882	445,092
February	505,593	443,734
March	610,678	543,711
April	585,705	569,728
Four months	2,311,858	2,002,265
May	702,000*	508,101
June	.....	523,689
July	.....	604,351
August	.....	678,092
September	.....	657,073
October	.....	601,021
November	.....	474,731
December	.....	384,318
Total	.....	6,533,641

Weekly Estimates

Week Ended	1950	1949
May 27	186,249	117,703
June 3	146,825	98,087
June 10	200,660	139,540
June 17	205,000	146,056

Estimates by Ward's Automotive Reports

* Preliminary.

What the entire industry, as well as its chroniclers, would like is a new term to identify this body style more accurately than does "hard-top convertible." No one has come up with one yet, which is why manufacturers have christened them with proper names which no one will remember. In any event, 1951 is going to see a lot more of them, and Ford is understood to be readying its version for appearance within the next few weeks.

Chrysler Programs New V-8

Chrysler Division's new V-8 engine program is moving along toward the production stage, with manufacturing to be centered at the Chrysler Jefferson plant. The plan is to move out the 6-cylinder engine lines to make way for the new project. The design of the V-8 is along the lines of the General Motors high-compression types which Olds and Cadillac now are building, with some important modifications.

One modification is the location of the spark plug which, in the Chrysler version, is squarely over the center of the piston instead of being to one side of the combustion chamber.

Industrial Safety Mark Set

A five-year record for industrial safety has been rung up by the Chrysler Division under direction of safety engineer Oscar F. Lehman, active in this work for the last 26 years.

Just about 127 million man-hours have been worked at the division plants during the last five calendar years without an accidental death or permanent disability occuring on the job.

Ford To Build Parts Depot

Ford Motor Co. has purchased a 12-acre industrial site in the Cleveland area as a location for parts depot which will be a one-story structure with about 160,000 sq ft of warehouse and office space.

It is located in Cuyahoga Heights, with rail connections to the New York Central. Construction of the parts depot is scheduled to start in the near term.

The company also recently signed a contract with the Panhandle Eastern Pipeline Co. for delivery into the Rouge plant at Dearborn of surplus gas at the eastern terminal of the Panhandle line. The deal calls for no specific amount of gas, only that available after the needs of other consumers, including storage fields, have been accommodated.

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ARISTOLOY STEELS

HIT THE MARK

Part of Copperweld's 11,000 tons monthly thermal-treating capacity, these modern furnaces are used for annealing coils.

ARISTOLOY STEELS

STANDARD STRUCTURAL ALLOY
BEARING QUALITY • ALLOY TOOL
SPECIALTY • NITRALLOY
CARBON TOOL • STAINLESS
MAGNAFLUX— AIRCRAFT QUALITY

COPPERWELD STEEL COMPANY, WARREN, OHIO

117 Liberty Street
New York, New York

176 W. Adams Street
Chicago, Illinois

P. O. Box 1633
Tulsa, Oklahoma

1578 Union Commerce Building
Cleveland, Ohio

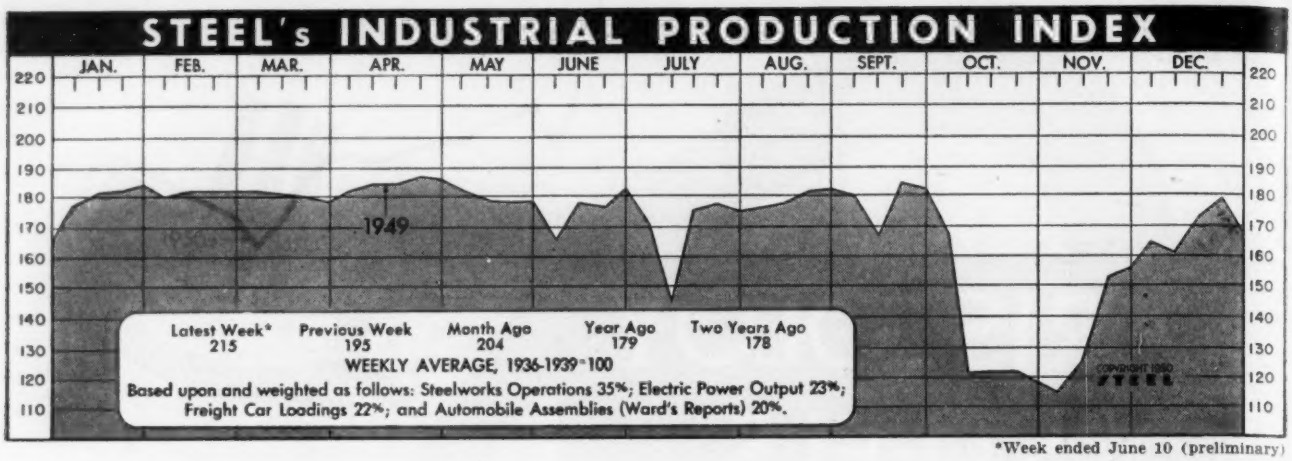
7251 General Motors Building
Detroit, Michigan

403 W. Eighth Street
Los Angeles 14, California

528 Fisher Building
Detroit, Michigan

3104 Smith Tower
Seattle, Washington

Monadnock Building
San Francisco 5, Calif.


STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
220 210 200 190 180 170 160 150 140 130 120 110
1949
Latest Week* 215
Previous Week 195
Month Ago 204
Year Ago 179
Two Years Ago 178
WEEKLY AVERAGE, 1936-1939=100
Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.
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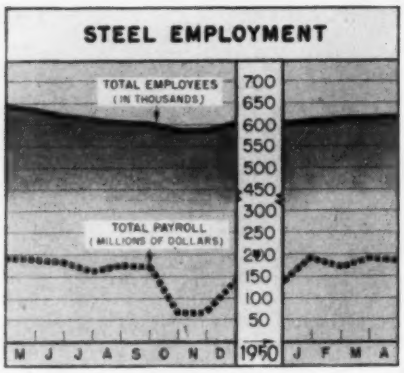
*Week ended June 10 (preliminary)

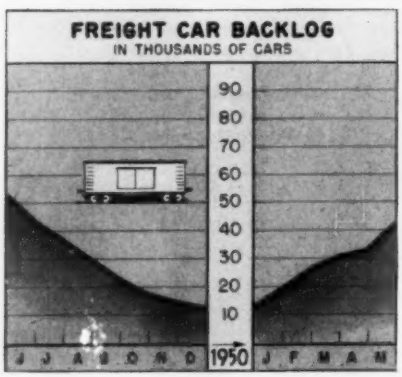

STEEL EMPLOYMENT
TOTAL EMPLOYEES (IN THOUSANDS)
TOTAL PAYROLL (MILLIONS OF DOLLARS)
700 650 600 550 500 450 300 250 200 150 100 50
M J J A S O N D 1950 J F M A

Charts—Copyright 1950, STEEL

Steel Employment, Payrolls

	Employees in Thousands		Payrolls in Millions	
	1950	1949	1950	1949
Jan.	609	650	$189.3	$202.1
Feb.	613	653	174.7	189.8
Mar.	616	652	190.0	207.2
Apr.	621	647	186.2	191.9
May	....	637	....	188.4
June	....	625	....	181.8
July	....	610	....	160.3
Aug.	....	603	....	175.6
Sept.	....	600	....	173.5
*Oct.	....	584	....	63.1
*Nov.	....	584	....	63.1
Dec.	....	602	....	136.9

Monthly average. * Averages taken from single figure for the two strike affected months. American Iron & Steel Institute.

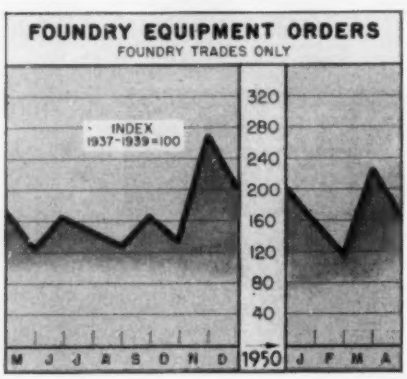


Freight Car Awards and Backlogs

	Awards		Backlogs*	
	1950	1949	1950	1949
Jan.	9,385	1,663	19,026	96,214
Feb.	9,075	332	26,055	85,974
Mar.	6,201	199	30,539	73,188
Apr.	3,308	30	32,857	62,569
May	11,636	589	42,300	52,281
June	....	153	.....	42,813
July	....	408	.....	36,564
Aug.	....	185	.....	28,731
Sept.	....	123	.....	22,203
Oct.	....	201	.....	17,377
Nov.	....	1,145	.....	14,146
Dec.	....	1,220	.....	12,036
Total	....	6,248		

*End of month.

American Railway Car Institute



Foundry Equipment Orders

	Index		Value in Thousands	
	1950	1949	1950	1949
Jan.	159.3	149.9	$731	$694
Feb.	113.1	144.4	519	668
Mar.	225.2	190.8	1,034	883
Apr.	160.6	172.0	737	797
May	....	121.9	....	565
June	....	164.9	....	764
July	....	146.6	....	679
Aug.	....	127.1	....	589
Sept.	....	166.6	....	772
Oct.	....	133.5	....	618
Nov.	....	270.4	....	1,250
Dec.	....	201.0	....	929

Foundry Equipment Mfrs. Assoc.

Issue Dates of Other FACTS and FIGURES Published by STEEL:

Constr. Valuation ..May22	Machine Tools May29	Refrigerators May29
Durable Goods June5	Mall. Iron Cast....May22	Steel Cast. May29
Fab. Struc. Steel...June12	Price Indexes May1	Steel Forgings June5
Furnaces, Indus. ..June12	Pump Orders June12	Steel Shipments ...May22
Furnaces, W. Air..May8	Purchasing Power June12	Trucks, Elec. Ind...Jan.2
Gear Sales June5	Radio, TV June12	Vacuum Cleaners ..June5
Gray Iron June5	Ranges, Elec. May29	Washer Sales June12
Indus. Prod. June5	Ranges, Gas May29	Water Heaters May29

Steel Industry Adds to Payrolls

Steel industry employment attained its highest point since June, 1949, and averaged 621,100 in April, says the American Iron & Steel Institute. The latest figure represents a 5500 increase over March with practically all of the gain during April being in wage earners.

Payments to wage earners averaged 170.7 cents per hour in April, compared with 169.7 cents in March and 168.8 in April, 1949. Average hours worked per week dipped slightly to 38.5 in April from 38.8 hours in the preceding month.

Even with a larger work force the industry's payroll for April fell short of the March total because of one less work-day. April's payroll aggregated $186,185,000, down about $3.8 million from the preceding month's total.

Freight Car Orders Turn Up

Freight car awards spurted to 11,636 in May from 3308 in April largely on the strength of the 10,000-car order placed by the Pennsylvania Railroad. Car builders got the most benefit from May orders as 11,414 were placed with them and only 222 went to railroad shops.

As the number of cars ordered under insurance company financed plans grows the private car builders backlogs grow accordingly. For the first time since Sept. 1, 1949, the car builders backlog is larger than that of the railroad shops. On June 1 the backlog was: Car builders, 25,392; railroad shops, 16,908; total, 42,300. This compares with 32,857 on May 1 and 52,281 on June 1, 1949.

Deliveries in May recovered substantially from their postwar low reached in the preceding month. May deliveries were 2193, compared with 971 in April and 9525 in May, 1949. Car builders delivered 1211 and railroad shops added 982 in the latest month.

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The Business Trend

Industry is off to a flying start toward a record production month. Metalworking and metalproducing firms are pacesetters in the drive toward new alltime marks

METALWORKING and metalproducing industries will be able to take a big bow if a new postwar production record is set this month. Not all are operating at a record pace but all segments of the metals industries are producing rapidly enough so no one can be accused of dragging his feet.

Although the second half is expected to reflect some slowing in industry's pace, there are no signs that the industrial machine is getting ready to slow down. A monkey wrench in the works may be the continuing upward price pressure. Price advances in consumer lines might have a dampening effect on business and manufacturers trying to hold the price line are beginning to feel like the Dutch boy at the dike. Raw materials and labor costs are both up and finished goods prices have edged up in several lines with others likely to follow soon.

Businessmen are hesitant about raising prices because they fear such action may hurt the present high demand and accompanying record level production. New home prices have already moved up in price and many metalworking executives are keeping an anxious eye peeled in that direction since much of their business depends on new housing.

While alert to possible future developments industry is not slackening its current efforts. In the week ended June 10, STEEL'S industrial production index set another alltime high reaching a preliminary 215 per cent of the 1936-1939 average. The latest index represents a 20 point recovery from the preceding week and is 5 points above the former record posted two weeks earlier.

Automobiles . . .

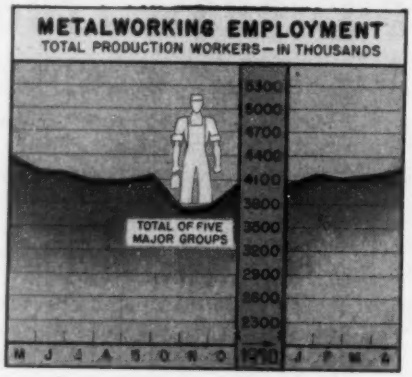
In looking for reasons for the new output record one need look no further than the automotive industry. Passenger car and truck output reached a startling 200,663 assemblies in the week ended June 10, about 14,000 units better than the former alltime record set two weeks earlier. U. S. plants turned out 169,613 cars and 31,050 trucks during the week while Canadian plants added 6831 cars and 2244 trucks. In view of this performance the automakers' goal for June—100,000 U. S. passenger cars more than in record-setting May—is fully capable of realization and is not just an industry pipe dream.

Steelmaking . . .

Steelmakers striving to keep up with high demand are operating their mills in excess of practical capacity but consumers are screaming for still more steel. Output of steel for ingots and castings set a new monthly record in May and will be near the same total this month. In the week ended June 10 operations were at 101.5 per cent of capacity and the same rapid pace was maintained last week. Steelmaking furnaces have been operating at or above capacity for nine consecutive weeks and there is no sign of any slowing in the rate. Consumers are anxiously watching the steel market to see if the big pro-

BAROMETERS of BUSINESS

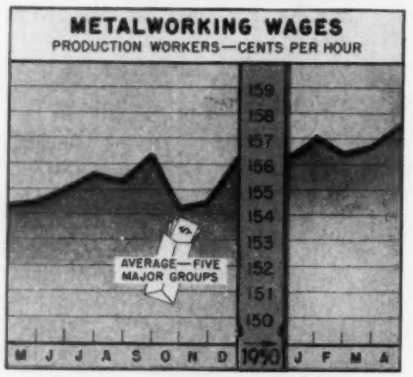
	LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
Steel Ingot Output (per cent of capacity)†	101.5	101.5	100.5	87.5
Electric Power Distributed (million kilowatt hours)	5,921	5,632	5,864	5,300
Bituminous Coal Production (daily av.—1000 tons)	1,549	1,700	1,797	1,681
Petroleum Production (daily av.—1000 bbl)	5,305	5,205	5,118	4,930
Construction Volume (ENR—Unit $1,000,000)	$226.7	$206.5	$183.3	$226.2
Automobile and Truck Output (Ward's—number units)	200,663	146,825	174,480	137,013
* Dates on request. † 1950 weekly capacity is 1,906,267 net tons. 1949 weekly capacity was 1,843,516 net tons.				
Freight Car Loadings (unit—1000 cars)	775†	710	717	808
Business Failures (Dun & Bradstreet, number)	164	168	217	174
Money in Circulation (in millions of dollars)‡	$27,079	$27,088	$27,041	$27,484
Department Store Sales (changes from like wk. a yr. ago)‡	+1%	+2%	−10%	−8%
† Preliminary. ‡ Federal Reserve Board.				
Bank Clearings (Dun & Bradstreet—millions)	$14,360	$11,350	$13,107	$13,191
Federal Gross Debt (billions)	$256.2	$256.4	$255.8	$251.6
Bond Volume, NYSE (millions)	$27.2	$12.8	$17.5	$16.1
Stocks Sales, NYSE (thousands of shares)	9,542	5,675	9,386	4,605
Loans and Investments (billions)†	$67.1	$67.0	$66.5	$62.3
United States Gov't Obligations Held (millions)†	$36,424	$36,359	$35,916	$34,035
† Member banks, Federal Reserve System.				
STEEL's Weighted Finished Steel Price Index††	156.13	156.13	156.13	152.90
STEEL's Nonferrous Price Index‡	184.1	176.8	169.5	169.6
All Commodities†	157.4	156.8	155.1	156.2
Metals and Metal Products†	172.6	171.3	170.1	168.6
† Bureau of Labor Statistics Index, 1926 = 100. ‡ 1936-1939 = 100. †† 1935-1939 = 100.				



Metalworking Employment

1949	Prim. Mtls.	Fab. Prod.	Mach- inery	Elec. Mchy.	Trans. Equip.
Apr.	1,028	706	1,066	560	1,012
May	991	683	1,014	538	955
June	971	679	977	518	995
July	934	671	939	505	1,014
Aug.	932	688	927	507	998
Sept.	938	708	935	531	1,017
Oct.	559	677	922	548	986
Nov.	737	666	908	546	898
Dec.	955	988	929	558	896
1950					
Jan.	963	693	936	561	978
Feb.	977	699	959	572	872
Mar.	981	710	980	579	881
Apr.	1,004	723	1,000	594	900

Bureau of Labor Statistics

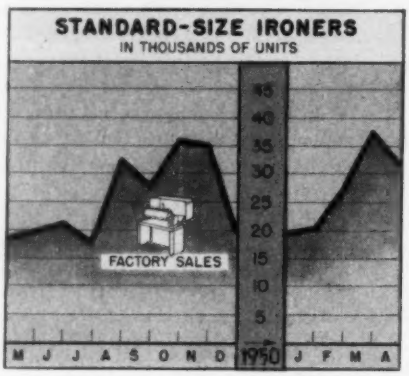


Metalworking Hourly Wages

Production Workers—Five Major Groups

1949	Prim. Mtls.	Fab. Prod.	Mach- inery	Elec. Mchy.	Trans. Equip.
Apr.	158.2	145.2	152.3	144.4	164.3
May	158.4	145.3	152.3	144.3	165.0
June	158.1	146.4	152.9	144.0	165.8
July	159.1	146.6	153.0	144.7	166.1
Aug.	158.1	146.8	153.1	145.1	166.0
Sept.	160.7	147.4	153.8	144.7	167.4
Oct.	155.6	145.9	153.6	143.5	165.6
Nov.	158.0	145.1	153.8	143.5	166.2
Dec.	159.7	147.2	154.3	144.6	168.4
1950					
Jan.	161.5	148.8	154.7	144.3	168.2
Feb.	160.2	148.1	155.2	144.5	167.7
Mar.	160.2	147.9	156.0	144.8	168.0
Apr.	161.1	148.2	157.1	144.8	170.4

Bureau of Labor Statistics



Standard-Size Ironers

Factory Sales—Units

	1950	1949	1948
Jan.	20,300	28,300	40,192
Feb.	27,600	28,400	51,651
Mar.	37,800	23,800	53,686
Apr.	31,600	18,100	47,319
May	.....	19,500	44,954
June	.....	21,100	32,767
July	.....	17,700	26,679
Aug.	.....	32,300	35,203
Sept.	.....	27,700	37,308
Oct.	.....	36,045	38,517
Nov.	.....	35,000	42,000
Dec.	.....	19,400	26,000
Totals ..		307,345	476,860

American Washer & Ironer Mfrs. Assoc.

Charts—Copyright, 1950, STEEL

ducers will boost prices as some smaller companies have done already.

Personal Incomes . . .

Personal income in April, other than special insurance dividends to veterans, was at a $212.8 billion annual rate in April, compared with $212.2 billion in March. Total personal income was at a lower annual rate in April than March, the Commerce Department says, because of a decline in veterans' insurance disbursements in the later month. The $600 million rise in personal income exclusive of the insurance payments was the result of expanded payrolls.

Construction . . .

Heavy engineering contracts reached a new peacetime high in May. Awards totaled $931.2 million and were 59 per cent above May a year ago and 5 per cent above April. May's private construction awards were $493 million, 111 per cent above a year ago but 10 per cent under April. Public construction more than took up the slack by climbing to $438 million and topping April awards by 31 per cent.

Electric Power . . .

Edison Electric Institute reports sales of electrical energy in the first quarter totaled 67,710,972,000 kwhr, up 6.2 per cent over the like period a year ago. These sales yielded a revenue of $1256 million or 7.3 per cent more than a year ago. Commercial or industrial users electric power bill totaled $655.2 million during the period.

Heating Market Still Grows

Warm air furnace makers may have best year in history. Replacement demand strong

OPPORTUNITIES are limited only by the imagination and drive of the men in the field, that is the belief of the warm air heating industry. Not only is business good but industry members see no reason for a decline.

Warm air heating units, both gravity and warm air, are expected to hit the 850,000 mark in sales this year and better the 844,476 unit postwar high reached in 1947. Last year sales totaled 717,785 units. Shipments in the first quarter were up 37 per cent over the like period a year ago, so the industry's estimate for the year is a conservative less-than-20 per cent increase.

Not all the volume already placed or the business expected for the remainder of this year is based on new home construction. About 500,000 units will go into new homes but a sizable 350,000 will be put into homes already in use.

"The trend is toward greater comfort in the home," says George Boeddener, managing director, National Warm Air Heating & Air Conditioning Association. "No longer does the fellow with a small home feel that winter air conditioning systems are only for the wealthy." This trend is proved by Census Bureau figures that show a constant rise in the percentage of total sales taken by winter air conditioning units. At the war's end gravity feed warm air systems had a commanding lead over the newer type. From 21 per cent of total warm air furnace shipments in 1945, the winter air conditioning type of unit has gained steadily until it captured 64 per cent of the total in 1949 and will be even higher this year. It is in the area of better heating that manufacturers expect to find their markets once the building boom subsides.

TV Gets an Assist — Even television is helping sales. A dealer in the Midwest tells of making sales to new television set owners. It wasn't until the home owners were immobilized in their favorite easy chairs for a couple of hours watching "Howdy Doody" and the wrestling matches that they realized their old heating systems were inadequate.

Potentialities of the market for the equipment are vast. The National Warm Air Heating & Ventilating Association estimates that 7 million of the 10 million warm air furnace owners own gravity feed systems and are prime sales prospects in the

UNIVERSITY OF MICHIGAN LIBRARIES

next few years. There are an additional 16 million homes that have no central heating plant. Admitting that some of these homes will never have anything but primitive heating systems for economic reasons, the 115 manufacturers, 80 wholesalers and 1898 dealers that make up the association feel they have fertile soil in which to work.

Concrete Slabs No Obstacle—It was in what originally appeared to be a gloomy area that warm air furnace manufacturers and contractors recently had one of their greatest successes. They appeared to be out of the running for heating basementless, concrete slab floored homes. It was then that their continuing research conducted at the University of Illinois paid off. A new perimeter heating development came out of the research project and is proving very successful. The system uses the floor as a radiant heating panel and also admits filtered, humidified and circulating warm air into the rooms.

Two major problems still face manufacturers: Steel supplies are tight and some manufacturers face a conversion problem. Those manufacturers whose business consisted chiefly of making coal-fired furnaces are rushing to test and get approved either gas or oil-fired units. Except for a few manufacturers who make coal-fired furnaces to be sold in Philadelphia or surrounding territory, the coal furnace makers are having it pretty tough. Gas supplies are now available in almost all large cities and the automaticity attending either gas or oil heat fits right into the picture of a modern heating plant.

Air Brake Business Picks Up

Improved second quarter showing over the first three months by New York Air Brake Co., New York, will reflect recent activity in the rail equipment field, says Bernard Peyton, president. Although the improvement which began in the March quarter has held to date, earnings in the first half will be below 1949's like period.

Unfilled orders are up moderately and should sustain present operating rate through the third quarter. The company's hydraulic division, supplier to builders of military aircraft, is working at capacity.

Fruehauf Works at Record Pace

Incoming orders of Fruehauf Trailer Co., Detroit, during May reached a $10.9 million total and net sales were $10.3 million, reports Roy Fruehauf, president. In the first five months this year total incoming orders amounted to $44,250,000 and established Fruehauf business at a record level, he continues. Net sales for the period were $40,623,000.

Backlogs Are Double Year Ago

Unfilled orders on hand at Rome Cable Corp., Rome, N. Y., are more than double those a year ago says H. T. Dyett, chairman. The company expects continuing large demand for the rest of the year barring something unforeseen.

Billings at the Rome plant are near record levels but the company's California plant is handicapped by lack of steel. Mr. Dyett adds that if steel shipments now promised are lived up to in July and August, billings will show a much larger volume.

Plant Expansions Exceed Expectations

AMERICAN business is not withering on the vine. Earlier estimates of the decline in plant and equipment expenditures by U. S. business erred on the gloomy side. Although the outlay by business will be below 1949 and 1948 because many postwar programs were completed last year, it will be off only 6 per cent instead of the 11 per cent shown in the previous survey made by the Securities & Exchange Commission and the Commerce Department.

Second quarter outlays are now expected to be about 6 per cent higher than previously anticipated and the third quarter total will exceed that for a year ago. On the negative side are first quarter expenditures which were $3.7 billion, 17 per cent under 1949's first quarter and 10 per cent less than anticipated.

Strike Causes Slump — Failure of first quarter expenditures to come up to expectations may be related to the loss in steel output due to the coal strike, say the government agencies. High spending rates planned for the second and third quarters represent in part some carryover from unfilled demand.

The current survey indicates that this year's total will be above the $16.1 billion anticipated at the beginning of the year. This in part is caused by the tendency of some companies to understate their capital outlays over the long term.

Gets Better and Better — Outlays for plant and equipment will total $4530 million in the second quarter, 3 per cent less than the $4660 million in 1949's second quarter. In the third quarter the estimated $4480 million expected to be spent will be 3 per cent more than the $4370 million used for the same purpose in the like period last year.

Manufacturing companies expenditures for the second and third quarters are: $1970 million and $1920 million, giving much of the impetus to the climb in plant outlays. Electric and gas utilities will also spend more in the same periods than a year ago. All others will spend less but with the exception of mining all the industries expect to spend more than was shown in the earlier survey.

Proportions Unchanged — Plant construction in the first nine months of 1950 is expected to amount to about one-third of total expenditures on plant and equipment, about the same proportion as in 1949.

Industry's Outlays Stay Up

. . . trail 1949 by only 6 per cent

Figures are in millions of dollars

U.S. Business' New Plant, Equipment Expenditures

Figures in millions of dollars	1949 Jan.-Mar.	1949 Apr.-June	1949 July-Sept.	1949 Oct.-Dec.	1950 Jan.-Mar.	1950 Apr.-June*	1950 July-Sept.*
Manufacturing	1,850	1,880	1,690	1,830	1,520	1,970	1,920
Mining	190	190	180	180	150	160	170
Railroad	360	380	310	300	230	300	290
Other Transportation	130	140	140	120	80	90	100
Electric and Gas Utilities	680	780	790	890	650	850	820
Commercial and misc.	1,260	1,290	1,260	1,320	1,060	1,170	1,180
Total	4,460	4,660	4,370	4,630	3,700	4,530	4,480

* Estimated. Note figures are rounded and will not necessarily add to totals. Source: Commerce Department, SEC.

Men of Industry

SELDEN T. WILLIAMS
. . . president, A. Schrader's Son Inc.

WILLIAM H. YECKLEY
. . . assistant to V. P., Youngstown Sheet & Tube

DR. KARL L. FETTERS
. . . assistant to V. P., Youngstown Sheet & Tube

Selden T. Williams was named president, **A. Schrader's Son Inc.,** Brooklyn, N. Y., division of Scovill Mfg. Co. Inc. In 1929 he joined A. Schrader's Son Inc. where he was general manager, and was appointed vice president of Scovill Mfg., in charge of manufacturing of Schrader domestic and foreign plants, in 1944.

Hapman Conveyors Inc., Detroit, and C. H. Dutton Co., Kalamazoo, Mich., have merged and the new company is known as **Hapman-Dutton Co. H. W. Hapman** is president and general manager, and **Robert J. Brown,** vice president, assistant general manager and treasurer. Hapman-Dutton Co. is composed of two divisions: Hapman Conveyors Division and Dutton Boiler Division. **Peter P. Ruppe** is assistant vice president in charge of Hapman Conveyors Division, which has its principal sales office in Detroit, and **J. David** is assistant vice president in charge of Dutton Boiler Division, Kalamazoo.

D. A. Currie, president and treasurer, **Erie Foundry Co.,** Erie, Pa., has resigned his added position of general manager, which is now assumed by **Robert N. Yates,** vice president of the company.

George L. Davis was elected president, **Northern Equipment Co.,** Erie, Pa., a division of Continental Foundry & Machine Co. He succeeds **E. W. Nick,** elected chairman of the board. Mr. Davis has served as president, Vulcan Soot Blower Division, Du Bois, Pa., since its acquisition by Continental in May, 1948, and will continue to serve as president of that division.

William H. Yeckley and **Dr. Karl L. Fetters** were named assistants to the vice president in charge of operations, **Youngstown Sheet & Tube Co.,** Youngstown. Mr. Yeckley formerly was general superintendent of the Campbell Works' steel plant, blast furnaces and Struthers works, and Dr. Fetters was special metallurgical engineer.

J. Lawrence Kennedy was elected vice president and secretary, **Kennedy Valve Mfg. Co.,** Elmira, N. Y., and was named to the board of directors.

James P. Raugh was elected a vice president, **General Refractories Co.,** Philadelphia. He has been general works manager.

C. A. Kral, management representative in Chile, S. A., for **Koppers Co. Inc.,** Pittsburgh, was appointed vice president in charge of operations and construction. He continues as management representative in Chile, where Koppers is building an integrated steel plant for Pacific Steel Corp. Mr. Kral also continues as a member of the board of directors.

James H. Rickey Jr. was made sales manager, **Ironton Fire Brick Co.,** Ironton, O. He has been in the production department for the last three years.

Brook A. Getz was named Pittsburgh sales representative, **Simmons Machine Tool Corp.,** Albany, N. Y.

V. H. Dieterich, vice president and director, **Joseph T. Ryerson & Son Inc.,** Chicago, has retired after more than 45 years' service with the company. He resigned his office in 1949 for reasons of health, and for the last year acted in a consulting and advisory capacity. He became vice president in 1937.

John F. Podger has joined **United States Testing Co. Inc.,** Hoboken, N. J., and will be available for consultation on mica mining, processing and grading.

Penn Industrial Instrument Corp., Philadelphia, appointed **George D. Keller** as manager, sales-engineering department.

Herman Pneumatic Machine Co., Pittsburgh, appointed **Joseph A. Blizman** sales and service engineer. He will be located in Evans City, Pa.

J. L. Stewart has been promoted from sales representative to assistant district manager, Chicago branch, **Universal-Cyclops Steel Corp. R. L. Springer** was appointed assistant district manager, tool steel sales, Chicago.

Harold B. Leland was appointed vice president-manufacturing, **Hood Rubber Co.,** Watertown, Mass., a division of B. F. Goodrich Co.

Richard P. Harman was appointed assistant district sales manager, Richmond, Calif., division, **Ford Motor Co.**

H. A. Oliphant, a sales representative for **General Electric Co.** in San Francisco, was appointed Seattle manager of appliance sales.

Physicists Research Co., Ann Arbor, Mich., appointed **Frank W. Kabat** as

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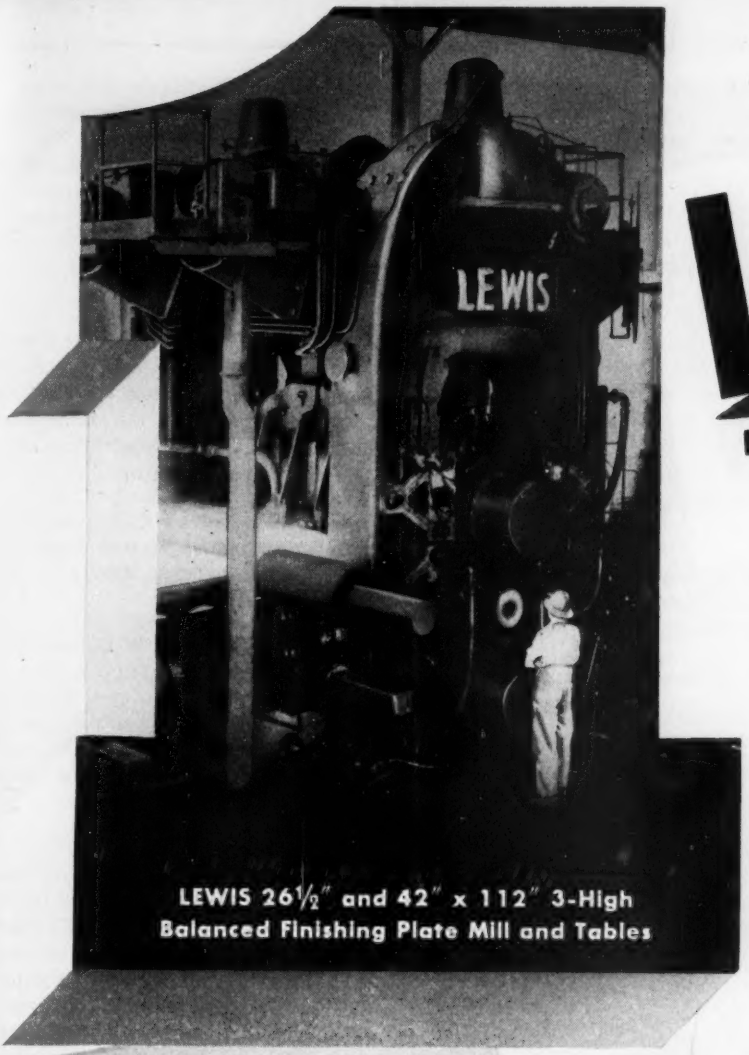
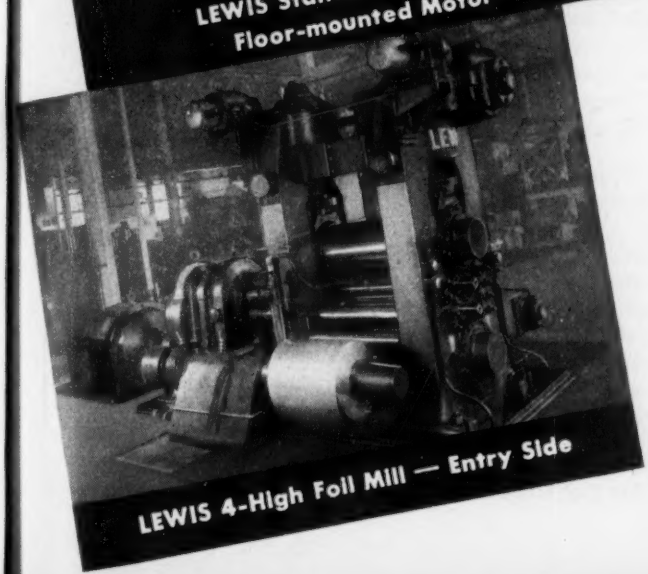


LEWIS 26½" and 42" x 112" 3-High
Balanced Finishing Plate Mill and Tables

LEWIS
ROLLING MILL EQUIPMENT

st...

LEWIS Standard Roll Lathe
Floor-mounted Motor



LEWIS 4-High Foil Mill — Entry Side

in the hearts of MILL OPERATORS

BEDS — Cooling
BLANKS — Gear • Pinion
BOXES — Coupling
CASTINGS — Rolling Mill Furnace
COILERS — Ferrous and Non-ferrous Strip
GEAR DRIVES
GEARS AND PINIONS — Bevel • Double Helical • Single Helical • Speed Reduction • Spur
HOUSING PINION — Rolling Mill
LATHES — Roll Turning
LEVELERS — Roller for Plate and Sheet
MACHINERY — Special • Flaking Mill • Rolling Mill
MACHINES — Pickling
MANIPULATORS — Rolling Mill
MILLS — Aluminum Foil • Bar • Billet and Blooming • Brass and Copper • Cold Rolling • Continuous • Edging • Four-High • Single Stand • Reversing and Tandem • Merchant • Plate Rolling • Precision • Sheet and Strip • Slabbing • Three-High • Tin Plate • Universal • Wire • Zinc Strip • Roughing and Finishing
REELS — Tension
ROLL RAGGING ATTACHMENTS
ROLL POLISHERS
ROLLS — Alloy Iron • Chilled Iron • Sand and Chilled Iron • Steel
SAWS — Hot and Cold
SCREWDOWNS — Motor Operated • Hand Operated
SHEARS — Alligator • Bar • Billet • Bloom • Continuous Automatic • Sheet Mill • Gate or Guillotine • Lever • Plate • Power Driven • Scrap • Vertical
STRAIGHTENERS — Angle • Bar • Rails and Shapes
TABLES — Blooming Mill • Rolling Mill Feed • Transfer for Mills

LEWIS FOUNDRY & MACHINE
Division of Blaw-Knox Co., Pittsburgh, Pa.
Designers and Builders of Rolls and Rolling Mill Equipment

head of the field representatives department. **Arnold W. Lloyd** and **George Haber Jr.** were appointed field representatives.

Erich G. Elg was appointed to the

ERICH G. ELG
. . . Copperweld manager, railroad sales

newly created position of manager of railroad sales, **Copperweld Steel Co.**, Glassport, Pa. He formerly was western sales manager, and will continue headquarters in Chicago. Mr. Elg joined Copperweld Steel 28 years ago.

James L. Johnson was appointed sales manager, **Cordley & Hayes,** New York.

S. H. Schachtel and **William E. Fertel** are now associated with the executive staff of **Luria Bros. & Co. Inc.** in the Midland Bldg., Cleveland.

Cleveland Industrial Tool Corp., Cleveland, appointed **R. S. Koroncai** as sales manager succeeding **Hunter N. Williams,** who was named vice president in charge of sales. Before joining Cleveland Industrial Mr. Koroncai was director of sales, Hydraulic Equipment Co.

William C. Miller was named advertising manager, **Royal Metal Mfg. Co.,** Chicago. He previously was assistant to the advertising manager, Fairbanks, Morse & Co.

Yarnall-Waring Co., Philadelphia, appointed: **Lytton C. Musselman** in charge of the Los Angeles district, with headquarters at its Huntington Park, Calif., office; **Power Engineering Co.**, general sales representative, Salt Lake City, Utah; **Wallace J. Agren,** sales engineer, Chicago, to succeed the late **F. C. Vaughan; R. W. Westlake,** sales engineer, Cleveland; **Andrew M. Ritter,** district manager, Detroit, replacing **Charles H. Grosjean** who returns to the New York territory. **Lyle G. Chase Jr.** joined the sales engineering staff, New York.

William E. Criss was appointed manager, order department, **Fort Duquesne Steel Co.,** Pittsburgh.

William H. Reiner was appointed assistant treasurer, and **George R. Sullivan,** assistant secretary, **Addressograph-Multigraph Corp.,** Cleveland. Mr. Reiner will serve concurrently with **Frank N. Harvey,** assistant treasurer; and Mr. Sullivan with **Donald C. Adams,** assistant secretary.

Melvin L. Bunting was appointed a technical service engineer, **Acheson Colloids Corp.,** Port Huron, Mich.

Joseph E. Rhoads was appointed general manager, **Plating & Galvanizing**

JOSEPH E. RHOADS
...general manager, Plating & Galvanizing Co.

Co., Cleveland. He formerly was vice president, Progressive Plating Corp., Elyria, O., and had association with Brown-Lipe Chapin Division, General Motors Corp.

Carl de Bourbon of Carbet Inc., New York, now heads the New York office of **Federal Machine & Welder Co.,** Warren, O. Federal formerly was represented by A. A. Probeck Co.

Don Rasmussen was appointed western sales supervisor, **Eutectic Welding Alloys Corp.,** New York. Also appointed to new positions were **Herman Greif** and **Daniel Wetmore,** regional managers; **Hugh Hurley** and **Roy Waldrop,** assistant regional managers; and **Don Garrett, Lee Wade** and **Alex Frederick,** district managers.

E. E. Broberg was appointed exclusive territorial sales agent for the Upper Peninsula of Michigan and most of Wisconsin by **Dings Magnetic Separator Co.** He will operate from the company's home office in Milwaukee. In northern California the company appointed **E. D. Sampson,** Sampson Sales Co., San Francisco, as sales agent; and in southern California, **A. W. Nash,** Los Angeles.

J. B. Maupin was appointed assistant works manager of the Ilion, N. Y., plant, **Remington Arms Co. Inc.** He formerly was with the Bridgeport, Conn., plant of the company in various executive capacities.

Mason M. Roberts was elected a vice president, **General Motors Corp.,** Detroit. He is general manager, Frigidaire Division.

Tennessee Coal, Iron & Railroad Co., Birmingham, appointed **Eugene P. Reed** assistant to the general superintendent, ore mines and quarries division. He is succeeded as manager, industrial relations, by **G. M. Neal; Edward H. Stevens** succeeds Mr. Neal as assistant manager.

Electric Metal Makers Guild Inc., Pittsburgh, elected as officers for the coming year: President, **D. L. Clark,** Simonds Saw & Steel Co., Lockport, N. Y.; vice president, **C. C. Spencer,** Electric Steel Casting Co., Indianapolis; secretary-treasurer, **R. J. McCurdy,** Republic Steel Corp.

W. R. Ryburn was appointed manager of sales, seamless products, for **Spang-Chalfant Division,** National

W. R. RYBURN
. . . seamless products, Spang-Chalfant

Supply Co., Pittsburgh. For the last three years he was manager, National Supply's drilling equipment sales at the company's general sales offices, Toledo, O. Mr. Ryburn succeeds **R. M. Burk,** who has left the company to enter the oil business, and

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J. K. Sutter was transferred from the Boston office to New York, and will work directly out of Spang-Chalfant's New York sales office.

James G. Ehrhorn was appointed sales manager, **Crescent Truck Co.,** Lebanon, Pa. He has been a member of the Cresent sales organization for the last four years.

Purchasing Agents Association of Buffalo elected **Elson E. Holrod,** Niagara Machine & Tool Works, as president to succeed **John C. Pfisterer.** Other officers elected are: First vice president, **E. C. Siverson;** second vice president, **Earl S. Goodwin;** secretary, **J. Edward Kidd;** and treasurer, **E. T. Obenchain.**

Black & Decker Mfg. Co., Towson, Md., appointed: **Robert A. Brown** sales engineer, Atlanta branch territory, and **George H. Thalman Jr.** to succeed Mr. Brown as service engineer, Cincinnati factory service station; **W. F. Dunn Jr.** sales engineer, New Orleans branch territory, and **Grady R. Funk** succeeds Mr. Dunn as service engineer, same territory; **Robert Dawson,** sales engineer, under supervision of **W. L. Poynter,** Kansas City, Mo., branch manager. Mr. Dawson will live in Omaha covering the Nebraska and western South Dakota region.

Ferracute Machine Co., Bridgeton, N. J., appointed **Kurt P. Wesseling** of K. P. Wesseling Co., St. Louis, as an agent. He will represent the Ferracute line of power presses in the St. Louis territory.

Robert G. Riegel joined **Kaiser Steel Corp.,** Fontana, Calif., as superintendent of its new electric weld pipe mill. He formerly was general foreman at Republic Steel Corp.'s Youngstown mill.

M. E. CAPOUCH
. . . manager, construction materials, A S & W

E. T. EGGERS
. . . manager, wire rope sales, A S & W

Perry T. Coons, veteran of 40 years of sales service with **American Steel & Wire Co.,** Cleveland, subsidiary, U. S. Steel Corp., was appointed assistant to vice president-sales. Since 1937 he was manager, wire rope and construction materials sales division, and that division will now be split into two separate sales units, with **M. E. Capouch** manager, construction materials sales division, and **E. T. Eggers,** manager, wire rope sales division.

Southern States Iron Roofing Co., Savannah, Ga., expanded its sales organization, and promoted to new positions: **D. F. Scales,** named general sales manager, a new position, to co-ordinate the district managers' efforts in the southeastern states, as well as other sales divisions—export sales and naval stores sales. Mr. Scales is succeeded as export sales manager by **W. A. Blun. Leo D. Sheridan** was promoted from Orlando, Fla., sales representative to Atlanta district sales manager; **Herbert C. Warwick** is now Raleigh, N. C., district sales manager; **Charles A. Rea** is the new manager, Birmingham district; and **John P. Starnes** takes over the post of Nashville, Tenn., district sales manager.

Frederick L. Bruckner was appointed Los Angeles district manager, **United States Steel Supply Co.,** subsidiary, U. S. Steel Corp. He succeeds **Paul Van Cleave** July 1 when the latter becomes sales vice president. **Hal P. Kibbey** was promoted to assistant Chicago district manager to succeed Mr. Bruckner.

Robert C. Medl has joined the staff of **Quaker Chemical Products Corp.** at Conshohocken, Pa., as technical director. He previously was vice president and technical director, McCormack-Medl Corp., Camden, N. J.

Edmund Pfeifer succeeds **Herbert G. Austin,** retired, as district manager of sales, Boston office, **Lukens Steel Co.**

C. A. Hulsemann was appointed manager, industrial brake sales department, aviation products division, **Goodyear Tire & Rubber Co.,** Akron.

OBITUARIES . . .

Alfred W. Gregg, 66, for the last 14 years consulting engineer for the foundry equipment department, **Whiting Corp.,** Harvey, Ill., died at Columbia Hospital, Milwaukee, June 8 after a short illness.

Howard M. Smith, 54, metallurgist at the Ambridge, Pa., plant of **Wyckoff Steel Co.** for the last 26 years, died June 2 as the result of an automobile crash.

George W. Grove, 63, veteran of more than 35 years with the **Bureau of Mines,** U. S. Department of the Interior, and a noted authority on coal mine safety, died June 5 in Pittsburgh.

Herman O. K. Meister, 62, general manager, **Hyatt Bearings Division,** Harrison, N. J., General Motors Corp., died June 10 at his summer home in Shelter Island, L. I.

Nathan Lester, 66, president, **Lester Engineering Co.** and **Lester-Phoenix Inc.,** Cleveland, died June 10. Born in Russia, where he learned die sinking in glass plants, Mr. Lester came to America 46 years ago. He was one of the pioneers in development of die casting and plastic molding methods and machines.

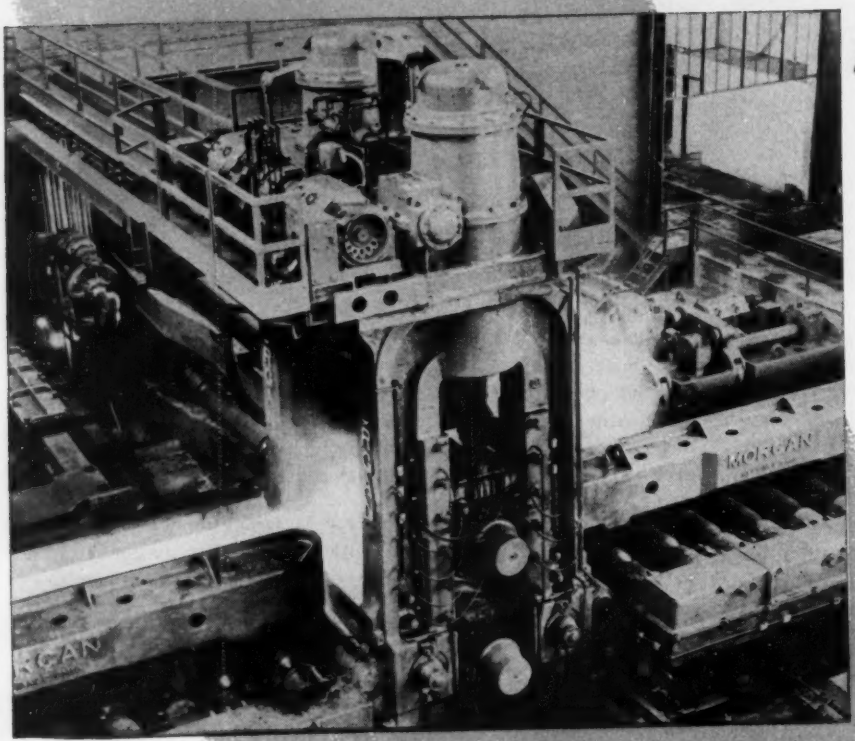
Earl B. Pridmore, 49, for the last seven years plant superintendent, **International Molding Machine Co.,** La Grange Park, Ill., died in Chicago May 13 of a heart attack.

Milton Gincig, 47, vice president, **A. J. Bayer Co.,** Los Angeles, died June 3.

Dr. William P. Hall, 46, chemical director, **Joseph Bancroft & Sons Co.,** Wilmington, Del., died June 7.

Terrell H. Walker, 65, executive engineer, **Combustion Engineering-Superheater Inc.,** New York, died June 9. He was an expert on installation and operation of power station equipment.

STEEL MILLS DEPEND ON Trabon FOR SAFE BEARING LUBRICATION!



Shown is a Trabon Automatic Lubricating System at work on a Morgan 40"—2 High Reversing Blooming Mill in the plant of a large steel producer.

No neglected or underlubricated bearings here! No worn-out bearings due to lack of lubrication! No down time for replacements or repair! Instead, schedules stepped up, production increased, operating and maintenance costs kept at a minimum.

Trabon systems are sealed—there are no exposed moving parts. Operate efficiently when buried in dust, water, dirt, or grime. Trabon has ONE indicator at the pump, assuring a measured amount of lubricant to each bearing.

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OIL AND GREASE SYSTEMS

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Production AND Engineering
NEWS AT A GLANCE

TWO SPOUTS EVERY 20 SECONDS— Two spouts can be welded to two stainless steel coffee pots every 20 seconds by a special series spot welder developed by Taylor-Winfield Corp., Warren, O. Equipped with one transformer for two welds, it controls automatically spot spacing, work indexing and electrode operation. In welding two spouts in one operation, the unit makes two watertight seams of 66 spots each. Appearance of each 6-inch seam is so good that a minimum of polishing is required. Welder loading and unloading is so fast that one operator can service three welders, the three units turning out 770 spouts per hour.

PACKAGING FOR AIR TRANSPORT— What happens to a package when it is transported by air? That is what the Packaging Branch of the Materials Laboratory at Air Materiel Command Headquarters, Dayton, O., is trying to find out through its new test chamber. The unit is expected to supply solutions to special problems of air transportation posed by temperature, altitude and vibration. Looking like a large walk-in vault, it simulates conditions at sea level, changing to those encountered at altitudes of around 50,000 feet in three minutes. Its temperature can be lowered 100° in the same period of time. Operating temperature range of the chamber extends from 165° to minus 65° F. A vibration table in the floor of the chamber carries loads up to 1000 pounds and provides 600 to 3600 vibrations per minute.

ACCURACY PLUS— Temperature of flames 5 feet in diameter reaching 5000° F now can be measured with an accuracy approaching plus or minus 1 per cent by an infrared technique, it was revealed by Dr. W. S. Tandler, executive director, Industrial Scientific Co., New York. The method was devised to meet the need of flame measurements in connection with development of construction materials for ram and turbo jets and rockets. It is rapid, and as its use becomes widespread in this particular field it may introduce a new temperature scale. According to Perkin-Elmer Corp., whose equipment is involved, it has the advantage of being theoretically absolute.

ANOTHER ENGINEERING MATERIAL— A new high strength plastic, which bridges the gap between soft and hard rubber, places in the hands of industry a new engineering material. Developed by U. S. Rubber Co., New York, it can be used for low cost gears in such applications as heavy-duty lathes, household appliances, plating barrels, automotive timing devices and dynamometers. Light in weight, the material has remarkable toughness, resistance to abrasion and deteriorating effects of oils, solvents, acids and alkalis. It is produced in the company's Fort Wayne, Ind., and Passaic, N. J., plants.

SAME MACHINE, DIFFERENT MATERIALS— Less down time and better end product performance are the two advantages being derived through precision finishing gears of different materials on the same machines at Maytag's Newton, Iowa, washer plant. No change of tooling or cycle time is involved. Both machines are Michigan underpass rotary gear finishers—one is used to finish two mating gears, one of gray iron, one of malleable. The other is employed in finishing the main formica drive gear and a steel pinion driven by a segment gear which gives the reciprocating action to the washer's gyrator. Precision obtained results not only in quieter washer operation but also longer gear life.

DETERMINES MACHINABILITY— Several hundred tests conducted by Revere engineers over a period of two years confirm quite conclusively results of a new method for determining machinability of free-cutting brass. Fast and highly accurate, the technique involves measuring and interpreting minute movements a cutting tool makes under changes of cutting stresses. With minor modifications, such as changing tool rake angles to fit the metals being tested, the method can be applied to steels and other alloys. (p. 84)

CHECK YOUR FINISHING — One reason surface quality control lags behind existing instrumentation and controls standards is that production men do not realize that methods available are no longer laboratory curiosities. Failure to give proper consideration to surface finish in the past, also can be attributed to lack of knowledge of the important part it plays in many operations, and the insufficiency of the standards and measuring methods that were available. Recent developments eliminate a number of these shortcomings and do a great deal to increase interest in control of surface finish. (p. 88)

NEW PLATING METHOD — Those interested in increasing wear resistance of gages, cylinder walls, piston rings etc., may be able to profit from a new plating technique that employs phosphorus alloys. Developed by National Bureau of Standards, the method involves electrodeposits of cobalt or nickel alloyed with as much as 15 per cent phosphorus. In commercial applications, these are reported to be more easily deposited than chromium, providing a bright, very hard, corrosion-resistant surface. (p. 99)

THREE-LADLE METHOD — Three ladles are employed during the desulphurizing procedure used by A. M. Byers to eliminate an estimated 90 per cent or more of sulphur from iron. The first receives the hot metal as well as three or four cans of sodium hydroxide at spaced intervals during the tap. Its contents then are poured into a hooded type ladle in which an unprecedented in sulphur reduction is obtained. The third ladle is employed to receive the desulphurized hot metal and transfer it to the converter. (p. 108)

By HARRY SCHAGRIN
Revere Copper & Brass Inc.
New York

How Revere Checks

MACHINABILITY

This rapid, accurate method for determining machinability of free cutting brass and other metals appears to have wide possibilities for evaluating effectiveness of tooling setups. The new quality control technique measures and interprets minute movements a cutting tool makes under changes of cutting stresses

MACHINABILITY of free cutting brass and other metals can be determined by a rapid, highly accurate test which measures and interprets minute movements a cutting tool makes under changes of cutting stresses. Accuracy and speed of the method were proved in several hundred tests conducted by Revere engineers over a period of more than two years. With minor modifications, such as changing tool rake angles to fit the metals being tested, the test can be applied to steels and other alloys.

High grade free cutting brass rod is so easy to machine that a sensitive test of its machinability is difficult to devise. In fact, for relatively slow and inexact machining one rod might perform so much like another that no machinability test would be significant. But users of this rod tend to push their machines to the limits of speeds and precisions of which the machines are capable. When this is done small factors can limit the performances of machines and inhibit quality control. Therefore a dependable test of machinability is desirable.

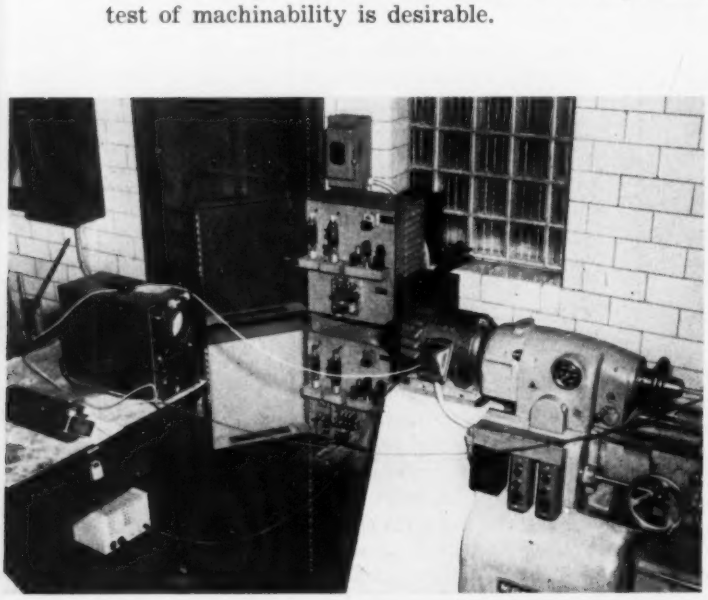

Fig. 1—Electronic control, oscilloscope, camera, tachometer and test bar in place at front end of the test machine

Machine Power No Factor—In working out such a test, measurement of the power input to the cutting machine was considered as a basis. This method is useful for materials which require considerable power to machine, such as some of the steels. But, free cutting brass requires so comparatively little power that any interpretation of power variations seemed to promise only general average results which would not be sensitive enough to assure the rod user that he was cutting rods of such constant qualities that any quality control troubles would be due to the machine or tools or other shop conditions and not to the rods.

Applying strain gages to the rods was also considered as a test basis, but no strain gages then available were rapid enough in action to give more than average readings. Even now it is not certain that easy machining free cutting brass rods deflect enough under their light cutting torques so that strain gages will yield adequately sensitive readings.

Measuring and interpreting movements of a cutting tool under changes of cutting stresses was finally decided upon as a suitable test basis.

Equipment Involved—A voltage regulator to flatten out any voltage variations in the shop line feeds to an electronic control which maintains an exact 1800 rpm on a dc drive motor through direct connection with the spindle of a high-grade toolmakers lathe. The lathe is specially prepared with all gears and belts and other friction or vibration producers removed, and with the spindle mounted on high precision preloaded lifetime-lubricated ball bearings.

The lathe is insulated against shop vibrations by being mounted on a 1-inch thick steel plate, the plate being attached to a concrete block 3 feet deep. The block is completely surrounded by 2 inches of sand. Lathe

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feed mechanism is driven by an individual dc motor which has its own precise electronic speed control. Thus there can be neither speed variation nor machine vibration sufficient to have any significant effect upon the movements of the cutting tool.

Integral with drive motor is a six-pole ac tachometer generator with leads to an oscilloscope. This tachometer is used when setting up a test, and remains connected in order to maintain synchronization.

Bar Tests Controlled—The tool point is ground to carefully standardized rake angles which are appropriate for machining free cutting brass rod. The tool bit is inserted to a standardized depth in a form tool holder which is accurately ground so it can be mounted with utmost rigidity in a precision-ground mounting. Tests of individual bars, therefore, are made under controlled tool application conditions and are directly comparable.

Live center is used in order to eliminate friction variables. Collets, couples and all other mechanical elements are similarly selected to eliminate variables.

A toolmakers dial gage readable to 0.0001-inch is permanently fixed in place at the tool mounting and is used only when setting up a test. Also at the tool mounting and by precise arrangement, the probe tip of a Brush vibration pickup is brought to exact contact with underside of tool tip.

This allows any tool motion to be transmitted to the crystal of the vibration pickup where the corresponding voltage changes produced are fed to an oscilloscope, these rapid changes manifesting themselves as patterns on the cathode ray screen.

To the oscilloscope a 35 mm camera can be attached by means of an adaptor. The camera is set for 1/30-second exposures, and has a peep hole for visual observations of the oscillographic pattern.

Setting Up for Test—All test bars are 8 inches long by 5/8-inch diameter, these dimensions being selected so that no variations of resiliencies of bars can be sufficient to affect the test results.

A specially prepared steel bar having a longitudinal scratch line is used as a standard for setting up. This bar is inserted in the machine; the tool is so adjusted that the tool point comes exactly to the scratch; contact of the vibration pickup is carefully adjusted against the tool; the steel bar is removed and the bar to be tested inserted. Thus, all tool settings are alike and variables are avoided.

The tachometer is connected to the oscilloscope and the vertical and horizontal gains are adjusted. Since the tachometer generator is a six-pole type, the production of a three sine wave pattern indicates that the oscilloscope and the spindle are so synchronized that one full sweep will give the pattern of one full revolution of the spindle. On this pattern the abscissa or horizontal line is the time element and the ordinate or vertical elements are the voltage changes.

A germanium diode rectifier cuts off the lower half of the wave on the oscillographic pattern. With only the upper half visible the test is clearer and the curves are more easily studied.

Operating a Test—All tests are run dry to eliminate any variables which differing performances of cutting oils might introduce. A standard 0.030-inch depth and 0.010-inch thickness of cut is used. It provides severe enough cutting conditions to yield a sensitive test.

Three successive cuts on the same 1-inch or more long profile of the test bar are taken. This is sufficient to compare the surface condition of the bar, as shown by the first cut, with the interior conditions as shown by the last two cuts. By limiting total depth to which the bar is cut to 0.090-inch the cross-section is not reduced to the point where torsional deflections will be introduced as variables.

The test operator observes the oscillographic patterns through the camera peep hole, and takes one photograph of each cut. The machined surface of the bar itself also is photographed.

Prior to making a test, a blank is run by having the entire unit in operation, but the tool not cutting. Photo of this condition as indicated on the cathode ray screen shows the cumulative result of all vibration and other extraneous forces other than those by the cutting tool.

Interpreting Tests—Variations of cutting pressures cause movements of the cutting tool, and these manifest themselves as variations of voltage at the crystal of the Brush vibration pickup and are registered on the oscillograph cathode ray tube. The most significant variations apparently occur when chips break off, a break-off apparently being preceded by a somewhat abrupt accumulation of pressure against the cutting edge and followed by a quick release of pressure.

The abrupt changes appear on the oscillographic

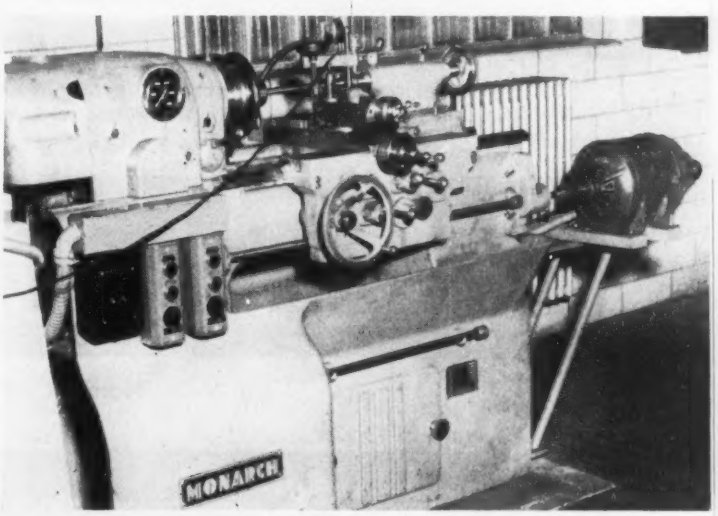

Fig. 2—(right)—Test machine, with separate feed drive motor at rear

Fig. 3—(below)—Oscillographs of several successive cuts on same bar tell the story. If uniform, as these are, then bar is good

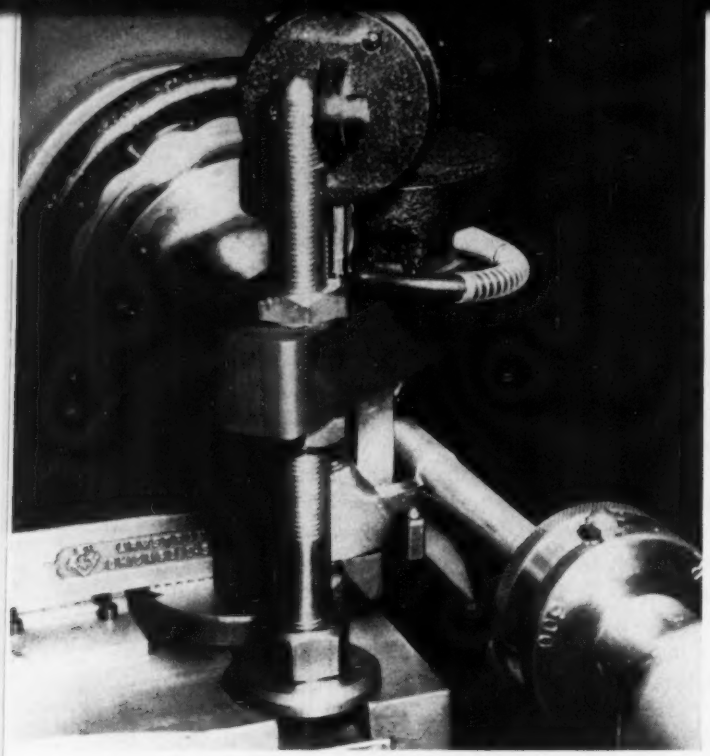

Fig. 4—Tool setup, with contact member, dial gage and vibration pickup

pattern as "pips" or loops or peaks. They vary in their distances from each other, their regularity or lack of regularity of occurrence, their heights or "violence", their abruptnesses, and their lengths or time endurances. Apparently, a different and distinctive pattern exists for every alloy and also for every degree of heat treatment or cold work or other physical condition of which any one alloy is capable.

Camera Catches Every Revolution—Since the lathe spindle is turning at 1800 rpm or 30 rps, and the camera has a 1/30-second timer, each shot of the camera covers one full sweep across the oscilloscope, which means one full revolution of the test bar.

By horizontal gain adjustments, the oscillographic pattern is spread to four times the normal 4-inch length, in order to clarify the pattern, but making the screen pattern represent ¼-revolution of the lathe or test rod. The 35 mm pictures of the oscillographic pattern are enlarged to seven magnifications for study and permanent record.

For a more detailed and representative study, seven camera shots are taken at 1-inch intervals across 8-inch test rod, and pictures attached lengthwise.

Uniformity of the patterns of a single strip then indicates uniformity of the alloy which was tested. Nonuniformity of pattern indicates nonuniformity of the alloy.

Practical Applications—First employment of this test served to confirm the uniformity of high grade free cutting brass rod. For this, some test bars were selected from stock; others bought in open market.

Next, nonuniform bars had to be studied for comparison. These were specially produced for testing, the nature and degree of faultiness thus being known and the fact that the test would find and identify the faults being provable.

Free cutting rods for some end purposes are given work hardening draws to stiffen them for more rigid resistance to the severe torques of some machining operations. By comparing the oscillographic patterns of the three cuts on single profiles of such rods the effective depth of the work hardening can be found, the effects of two draws as compared to only one can be determined, and the matching of the rod to the quality control procedures of the user can be certified.

The test has been applied to phosphor bronze which is somewhat difficult to machine, to tellurium copper which is easier, and to free cutting brass which is one of the most machinable alloys. A few pilot experimental tests have been made on steels. In every instance the test has demonstrated its validity. The matter of tool angle standards for alloys other than free cutting brass needs further consideration.

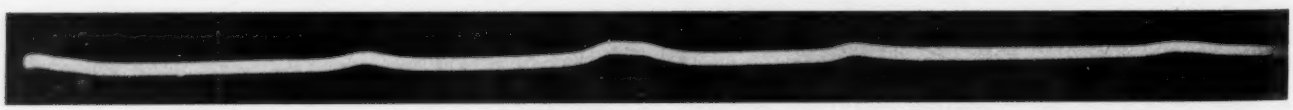

Fig. 5—Setup curve as it appears on the oscilloscope. Machine is operating correctly but no cutting is being done

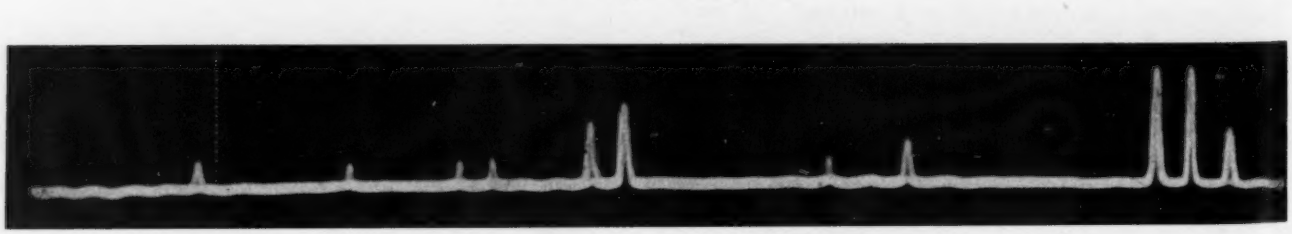

Fig. 6—Oscillographic pattern showing poor machinability

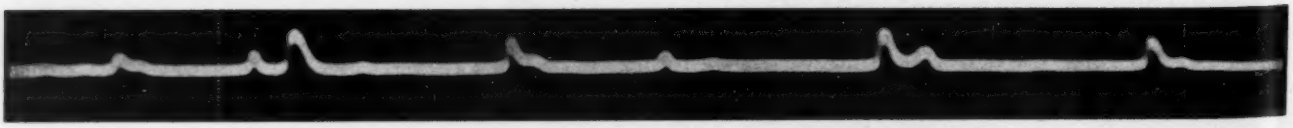

Fig. 7—Oscillographic pattern showing good machinability

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SEEN AND HEARD IN THE *Machinery Field*

By GUY HUBBARD
Machine Tool Editor

EFFICIENT MILLING: Through courtesy of Mason Britton, president, Metal Cutting Institute, Chrysler Building, New York 17, N. Y., I have just received an advance copy of an up-to-the-minute study of tool materials for milling cutters. Under the title *Efficient Milling,* this 28 page book boils down into useful form a comprehensive report made by the research and technical committee of the milling cutter division of the institute.

Aim of this book is to take selection of milling cutter materials out of the realm of "catalog engineering." It emphasizes that behavior of various tool materials while cutting may be secondary consideration. Ease and cost of cutter manufacture, simplicity and convenience of stocking or handling, ease of making modifications, cost and ease of grinding and availability actually may be factors which will outweigh spectacular performance.

It is in this spirit that section one of the book deals with overall economies of milling operations—practical diagrams, formulas and methods of analysis being introduced at this point. The other four sections are devoted to general characteristics of high speed steels, cast cutting alloys and carbides; selection of suitable material for a given job; problems involved in manufacture, maintenance and handling of cutters of the various materials; and recommended speeds, feeds and horsepower requirements.

To me this report on *Efficient Milling* is a splendid example of the good work constantly being accomplished by associations of American companies such as the Metal Cutting Institute. Member companies give generously of their specialized knowledge and experience and assign capable men to the work.

If you are concerned with making, specifying, using or reconditioning milling cutters—either in a small way or in a big way—I recommend *Efficient Milling* as a good initial investment at $1.00 per copy and as an even better investment of many dollars worth of your valuable reading time.

OVERLOOKING THE OBVIOUS: One of the big surprises to those of us who attended the 34th annual meeting, American Gear Manufacturers Association, was the statement by W. A. Williams, chief engineer, American Pulley Co., Philadelphia, that toothed wheels were the earliest form of continuous power transmission apparatus.

In his paper on the history of power transmission, Mr. Williams went on to say: "There has been a popular misconception that belts and pulleys were used by the Egyptians and the Babylonians for transmission of power. Actually no one has been able to prove that the ropes and pulleys used by the ancients for hoisting ever were adapted to continuous transmission of rotary motion before the year 1200 AD.

"Toothed wheels—on the other hand—were in use as early as 330 BC. The philosopher Aristotle describes toothed wheels as being employed in windlasses. By 220 BC toothed wheels were in use in hydraulic organs and in clocks."

Many of the complicated gear trains employed by ancient engineers could have been avoided by the simple expedient of running "endless belts" or ropes over drums. They often wound ropes from one drum to another but apparently they never caught onto the idea of "belting" one drum to another to give continuous rotation. Still more ancient engineers used rollers for centuries before they caught onto the idea of the wheel-and-axle which traveled along with the load.

There still is a tendency in engineering work to cling to traditional ways and to overlook better ways of the simplest nature. Within my time I have seen a machine tool problem of long standing solved by the simple expedient of "turning the machine upside down." One of the best things about our patent system is that it constantly stimulates inventors to seek ingenious ways to "get around patents". That has been responsible for some of the most sensational technological advances in American industry.

PRE-PROCESSED MATERIALS: When I made the rounds of the industrial exhibition staged last week in Cleveland in conjunction with the 35th annual convention of National Association of Purchasing Agents, I was impressed by the fact that many "raw materials" are not as raw as they used to be.

What I mean is that initial stages in manufacturing now can in many cases profitably be avoided through purchase of engineering materials which either wholly or in part have been "pre-processed" by suppliers who specialize in that sort of thing.

For example, I saw displays of hundreds of stock gears around which machines of considerable complexity effectively can be designed; pinion rods which can be converted into pinions in automatics; drawn shapes from which pawls, etc. can be cut; perforated metal which readily can be converted into attractive guards and covers; knurled bars which cut overall machining time; and ready-made gaskets, washers and bushings of infinite size and variety. This list could go on and on.

While one particular variety of "catalog engineering" is mentioned elsewhere on this page as something to be avoided, there are many other cases where it is thoroughly justified. I foresee that the smart purchasing agents who attended this show "are going to bat" with their engineering and production colleagues on this question: "Why are we purchasing so much raw material when all these pre-processed items are available?" Industrial purchasing agents today have sharp eyes and keen minds—as well as sharp pencils.

Watch Your Surface Finish

Quality is important factor in service performance and in product cost. To eliminate errors in judgment, to obtain dependable degree of accuracy, more and more companies are using surface finish measuring instruments as a regular part of their quality control equipment

PART I

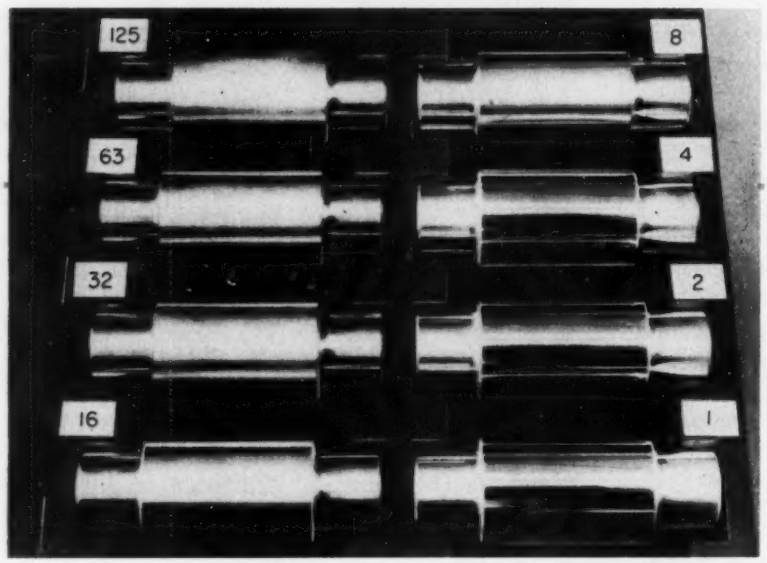

Fig. 1—Use of standard specimens was an early method for control of surface finish. Shown above is a set of ground standards produced by Norton Co. over 20 years ago. Value of such sets has increased greatly since they have been correlated with the recently adopted ASA standards on surface finish

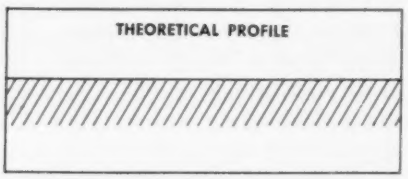

Fig. 2—Theoretical profile of a surface envisioned by a designer

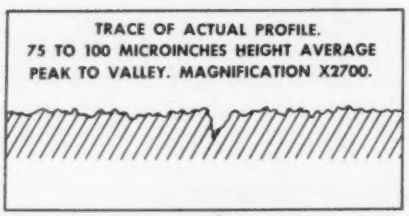

Fig. 3—Departure of the normal profile from theoretical profile because of roughness

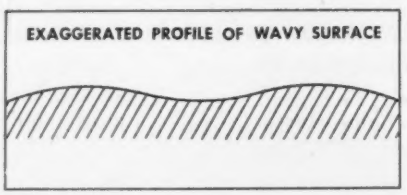

Fig. 4—Profile of a surface illustrating theoretical waviness

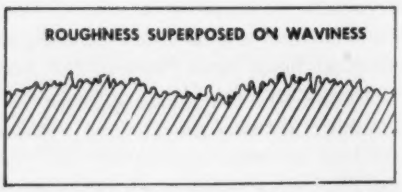

Fig. 5—Profile of surface showing how roughness can be superimposed on the waviness

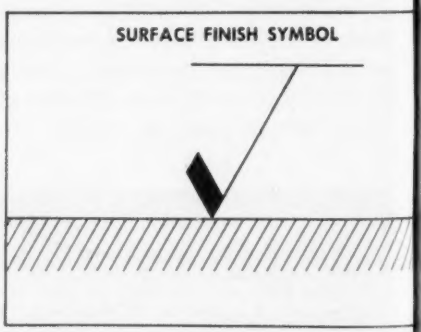

Fig. 6—Surface finish symbol by wh finish specifications may be indicated the drawings

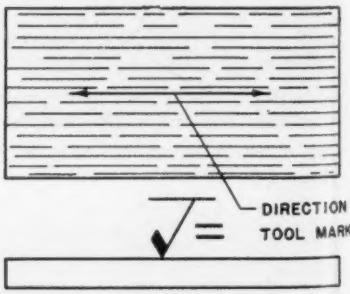

Fig. 7 — Parallel (horizontal) la symbol

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FOR many applications, quality of surface finish has as much, and sometimes more, bearing upon the service performance and cost of a product as do such factors as material composition, strength and dimensions. Yet adequate controls have been set up for these latter properties, while surface finish controls have been neglected. One reason surface quality control, today, lags behind existing instrumentation and control standards is that production men do not realize that the methods available are no longer laboratory curiosities. The new techniques can offer real and tangible help in many operations.

Failure to give proper consideration to surface finish in the past, also can be attributed to lack of knowledge of the important part it plays in many operations and the insufficiency of the standards and measuring methods that were available. Recent developments have eliminated a number of these shortcomings and have done a great deal to increase interest in control of surface finish. Rugged and compact equipment for measuring surface irregularities is available for everyday plant use. Studies recently reported[1] from the General Motors Research Laboratories by Arthur F. Underwood and Roy P. Trowbridge and from the Chrysler Corp. Laboratories[2] by C. R. Lewis, have described progress toward the development of a set of geometric surface finish standards. It is expected that such a set of precision physical standards of surface roughness will fill a long-felt need in industry and will serve a very useful purpose in manufacturing operations.

Why Surface Finish Control—There are many reasons why surface finish control is important. Among the qualities[3] that have been reported to be affected by changes in surface roughness are the following:

1. Life—Such vital factors as friction, abrasion, wear, lubrication, bearing area, corrosion, and galling are related to surface finish.
2. Function—Must the part slide freely, fit properly, prevent leakage, serve as a bearing, as a mating part, or rub over packings without damaging them?
3. Appearance—The appearance of plated and other decorative and protective coatings is an im-

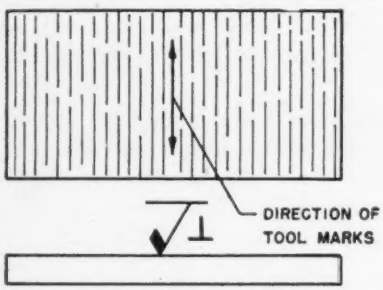


Fig. 8—Perpendicular (vertical) lay symbol

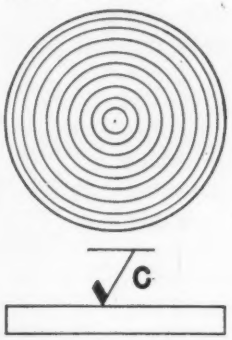


Fig. 11—Surface finish designation illustrating circular pattern relative to center

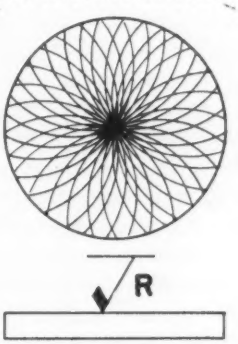


Fig. 12 — Designation approximately radial to center

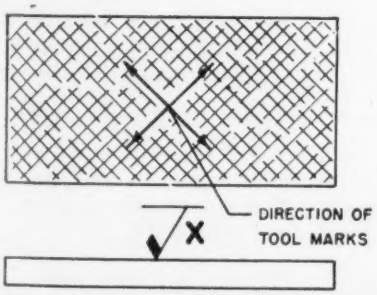


Fig. 9—Finish designation for angular in both directions

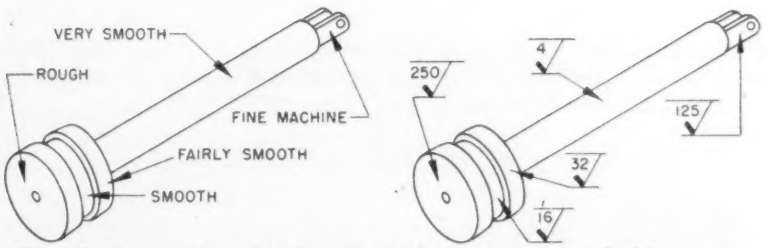


Fig. 13—Comparison of surface finish designation by verbal instruction using descriptive terms with designation using precise microinch values. Courtesy *Instruments*

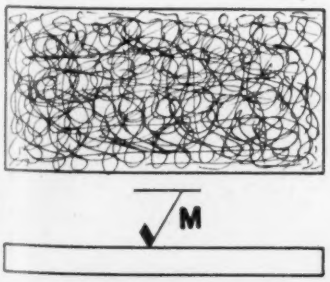
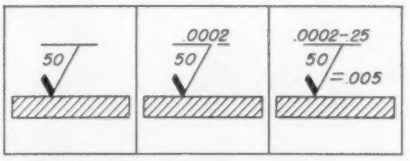


Fig. 10—Multidirectional finish designation

Fig. 14 — Designation of roughness, waviness and lay on drawings. Roughness height rating is to left of leg; lay symbol to right. Roughness width is to right of lay symbol; waviness height is above extension line; and waviness width is to right of waviness height



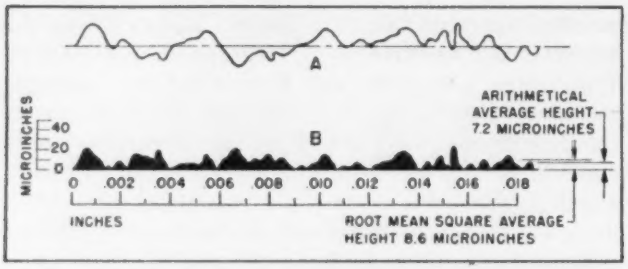


Fig. 15—(A) Profile of a surface to be measured, highly magnified. (B) Relationship between arithmetical average height and root mean square average height

portant consideration for many manufactured products.

4. Safety—Stress concentrations, fatigue strength, notch sensitivity, and imposed loads are all related to the quality of surface finish.
5. Heat Transmission—As a general rule, smooth surfaces offer better heat conductivity.

Costs To Be Considered—Surface of all materials finished by grinding, milling, turning, planing, and other methods is composed of countless tiny irregularities. These irregularities completely cover the surface and form a mat which, to a large extent, determines its appearance and its suitability for a particular purpose. Most production men realize that it is seldom good economy to make a surface smoother than it really needs to be, unless it can be finished at the same time another adjacent surface is finished, or unless the only means of sizing will actually produce a smooth surface.

As a general rule, from an economic standpoint, rougher surfaces cost less than smooth ones. Thus, one important point is to determine which surfaces are critical and which are not. The adoption of a proper drawing notation which will point out those surfaces of a part which need special care and a fine finish and those which can be allowed to remain rough will in many instances reduce costs by preventing misapplication of effort.

In production methods of the past, the degree of surface finish applied to a finished article depended upon the judgment of the machinist doing the finishing. As an individual machinist, he usually could duplicate finishes on similar articles with a fair degree of accuracy. However, in modern methods of production, the machinist has given way to the machine tool and the machine tool operator as the large supplier of mass-produced items.

Designer Designates Finish—Responsibility for designating the surface finish has shifted to the designer and engineer. While, like the earlier machinist, they must rely on previous experience or new experimentation for the degree of surface finish required, they differ from old-time methods in that they have resorted to standardization specimen sets and instrumentation as a means of designating and controlling the surfaces.

This is very important as a means of transferring surface finish control methods from one shop to another. By previous methods there was no way of correlating the finish of surfaces produced by dissimilar methods; attempts to control the surface by designating the method of machining it, fail because wide variations can occur due to dissimilar materials, physical characteristics, feeds, depths of cut, pressures, grit sizes, bonding materials, and the lubricants.

The original and most basic method of specifying a surface was to refer to a specimen surface. A number of years ago Norton Co. produced a standard set of ground specimens for their own use and for distribution to others. General Electric also developed such a set. Today, there are many specimen sets commercially available whose specimens are samples of machined or ground or otherwise naturally machined finishes. Use of these specimens has greatly clarified the problem of controlling surface finishes, especially since they have been correlated with the recently adopted American Standards Association B46.1 standard on surface finish.

No Standard Measure—(*Please turn to Page* 115)

Fig. 16—Profilometer being used for making shop measurement on surface finish of a machined casting. Courtesy Physicists Research Co.

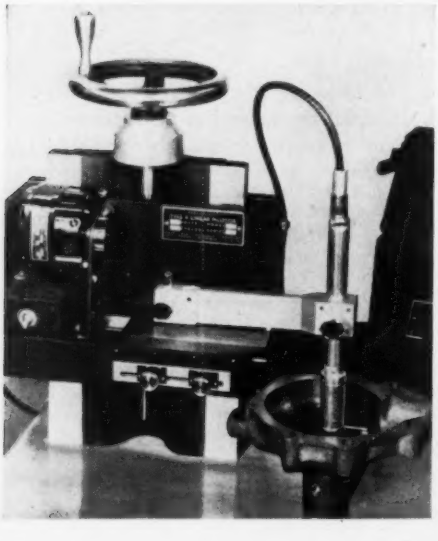


Fig. 17—Brush surface analyzer in use for making a surface finish measurement on a machined part. Courtesy Brush Development Co.

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By ROBERT MAWSON

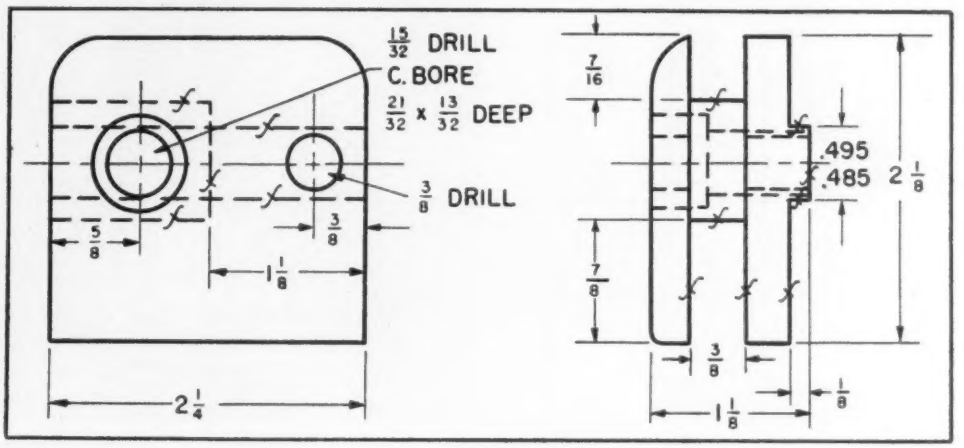

Fig. 1—Reverse dog made of a Meehanite casting, and used on the sliding table of grinding machines built by Norton Co.

Reduce Machine Down-Time With Better Work Holders

Milling fixtures with workpiece ejectors may help you save on machining costs

TO machine a piece accurately, milling machine fixtures must locate the workpiece positively and also hold it securely. If the tool is to prove efficient as a cost-reduction piece of equipment the lost or unproductive time must be the shortest percentage of the total, or in and out, manufacturing time. Fixtures with workpiece ejectors save time and cut costs.

Fig. 1 shows a right hand reverse dog, from a Meehanite casting, for use on the sliding table of the grinding machines built by Norton Co., Worcester, Mass. Sequence of operations to produce this detail are: 1. Mill back and tongue; 2. drill, ream and counterbore; 3. mill ⅜-inch slot on three sides; 4. trim and burr complete.

Fixture Design—Fixture used for operation 3 is illustrated in Fig. 2. This fixture is made with a cast iron body (1) finish machined on surfaces "f", Fig. 1. In a machined groove in the bottom surface of the body are fastened with socket head screws (2) two machine steel keys (6) which have been machined to have a good fit in the table slot.

On a machined surface in the fixture body four steel socket head screws (10) fasten a machine steel hardened locating block (2). In this detail are machined grooves at right angles to be a good sliding fit for the 0.498-0.485 tongue on the workpiece. In three of the grooves in the block are located machine steel, hardened, ejector pins (5) which are maintained in the sliding position with socket head screws (9). In alignment with the ejector pins, at the right hand end, and threaded into the fixture body are machine steel collars (7) each with a hole through which the stem of the ejector pin can slide. Between the shoulder of each pin and collar is placed a steel tension spring (14).

Accurately located in the path of the locating grooves in the block (2) is a hardened steel pin (8) which has been machined to be an easy sliding fit in the 15/32-inch drilled hole in the workpiece. In a drilled and tapped hole in the body is a threaded steel stud (4) and on this stud is a hardened steel clamp (3) which has been machined on the upper portion with a rounded contour to contact the workpiece.

On the outer surface of the clamp is a steel washer (16), and a steel hexagon nut (15), threaded on the stud, is used to operate the clamp. Between the inner face of the clamp and surface of the fixture body is a steel tension spring (17) to raise the clamp when pressure is removed by screwing back the hexagon nut.

In a drilled and tapped hole in the body a threaded steel stud (12) is located which can be adjusted and then fastened in place with the hexagon nut (13) to suit the best holding position of the clamp.

Fixture Located—To perform the milling operation, the fixture is first located with the two keys (6) fitting the table slot and held in place by tightening the nuts on two T-head bolts placed in the table slot and through the openings in the fixture body. A milling cutter of the correct size is fastened in the head of the horizontal milling machine in the conventional manner.

Nut of the clamp is then screwed back until the clamp can be rotated out of the machining position. One of the workpieces, to be milled, is now placed in the fixture being located with the pin (8) and the machined tongue fitting into the groove in the block (2). The clamp is next rotated into position until it rests on the pin (12) and by tightening the clamp nut the workpiece is held securely in position.

As the workpiece is forced into the fixture with

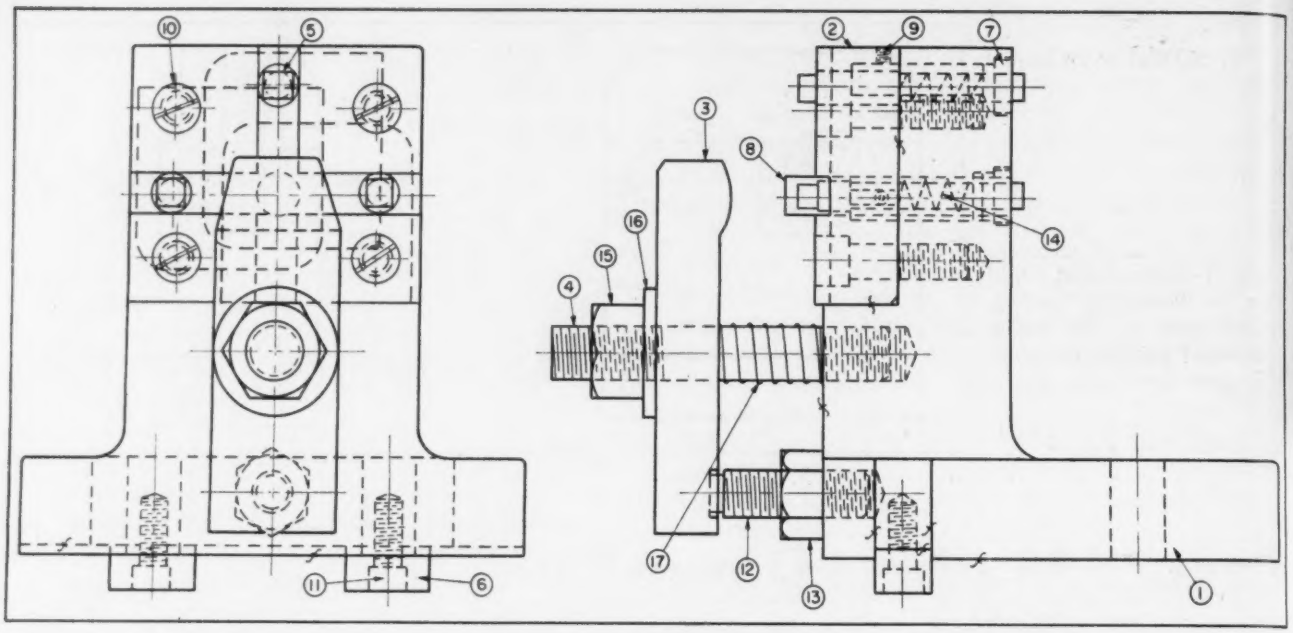

Fig. 2—Fixture used to mill ⅜-inch slot on three sides

the clamp the lower surface of the piece comes in contact with the ejector pin (5) which is under the workpiece. This action pushes down the pin and compresses the spring (14). The table and therefore the fixture is now fed to a position stop and as the table is moved up or down revolving cutter mills a ⅜-inch slot.

Clamp Screwed Back—The clamp nut is then screwed back for a short distance until the clamp can be rotated from contact with the piece. As the clamp pressure is removed from the workpiece the ejector pin spring pushes the pin against the piece and forces it out of the locating groove. The piece can then be removed from the fixture, rotated to another milling position, located and fastened as described and another ⅜-inch slot milled. These sequence of jobs are again repeated for milling the third ⅜-inch slot.

In the illustration is shown by the heavy lines positions of the workpiece when milling the three slots. This fixture locates the workpiece accurately, holds it securely and requires only one fastening detail for the operation in conjuction with the interesting ejector feature. The fixture can, therefore, be considered a well designed and efficient cost-reduction piece of manufacturing equipment.

Titanium Bridges the Gap

INSOFAR as density, modulus and strength at intermediate temperatures are concerned, titanium fills the gap between the aluminum alloys and stainless steel. This was brought out by Brig. Gen. Frederick R. Dent Jr., deputy chief, Engineering Division, Air Materiel Command, Wright-Patterson Air Force Base, Dayton, O., who believes that the metal has many potentialities in aircraft construction, as it is light, strong, ductile and corrosion resistant (see STEEL, Mar. 20, 1950).

On a strength-weight basis, cold-worked titanium and titanium alloys are said to be equal or superior to the best of the other materials. Based on elastic buckling of slender columns, Brig. Gen. Dent reports that it is superior to steel, but inferior to aluminum or magnesium.

Magnesium and aluminum are not considered as having any useful load carrying ability at temperatures above 600° F, while titanium is indicated to have useful creep strength at temperatures as high as 1000° F, it is reported. Current interest of the Air Force in titanium and its alloys is due to the fact that wherever it is possible to substitute titanium, gage for gage, for stainless steel, a 40 per cent savings in weight occurs. A recent study made in connection with an airplane under development indicated that a weight savings of 1200 pounds could be realized by the direct substitution of titanium, as appeared practical, for stainless steel. Even at the current price of $20 per pound for titanium, this substitution is said to be economically sound.

Not Metal—Not Plastic

NEITHER a metal nor a plastic, yet having the qualities of both, is a new casting compound developed by Plastics Division, Lockrey Co., College Point, N. Y. Called Plasti-Metl, it is the color of copper, harder than some casting metals, yet may be poured into molds at room temperature, the company reports. With the aid of varying amounts of a catalyst, it can be made to set at room temperature without heat, or in an oven at low temperatures, forming a hard, tough, metallic-appearing casting which may be machined or polished with ordinary tools. Once it is set it cannot be softened with heat and is completely resistant to all common chemicals except strong alkalies.

Cleaner Functions Three Ways

REMOVING oil, removing rust and preparing metal for paint are the three functions of a new cleaner developed by Oakite Products Inc., New York. All are performed simultaneously. The solvent and detergent properties remove stamping and forming oils, rust preventives, carbon smuts, soldering and welding fluxes, identification inks, etc

In addition, this material contains acid ingredients that act on heat scale, tarnish and other oxides, plus making rust removal a fast operation. Known as compound No. 33, the cleaning material has the ability to convert the surface layer of metal into a thin film of insoluble phosphates, making an excellent bond for paint. It is also said to have a similar etching and conditioning action on aluminum sheets and castings.

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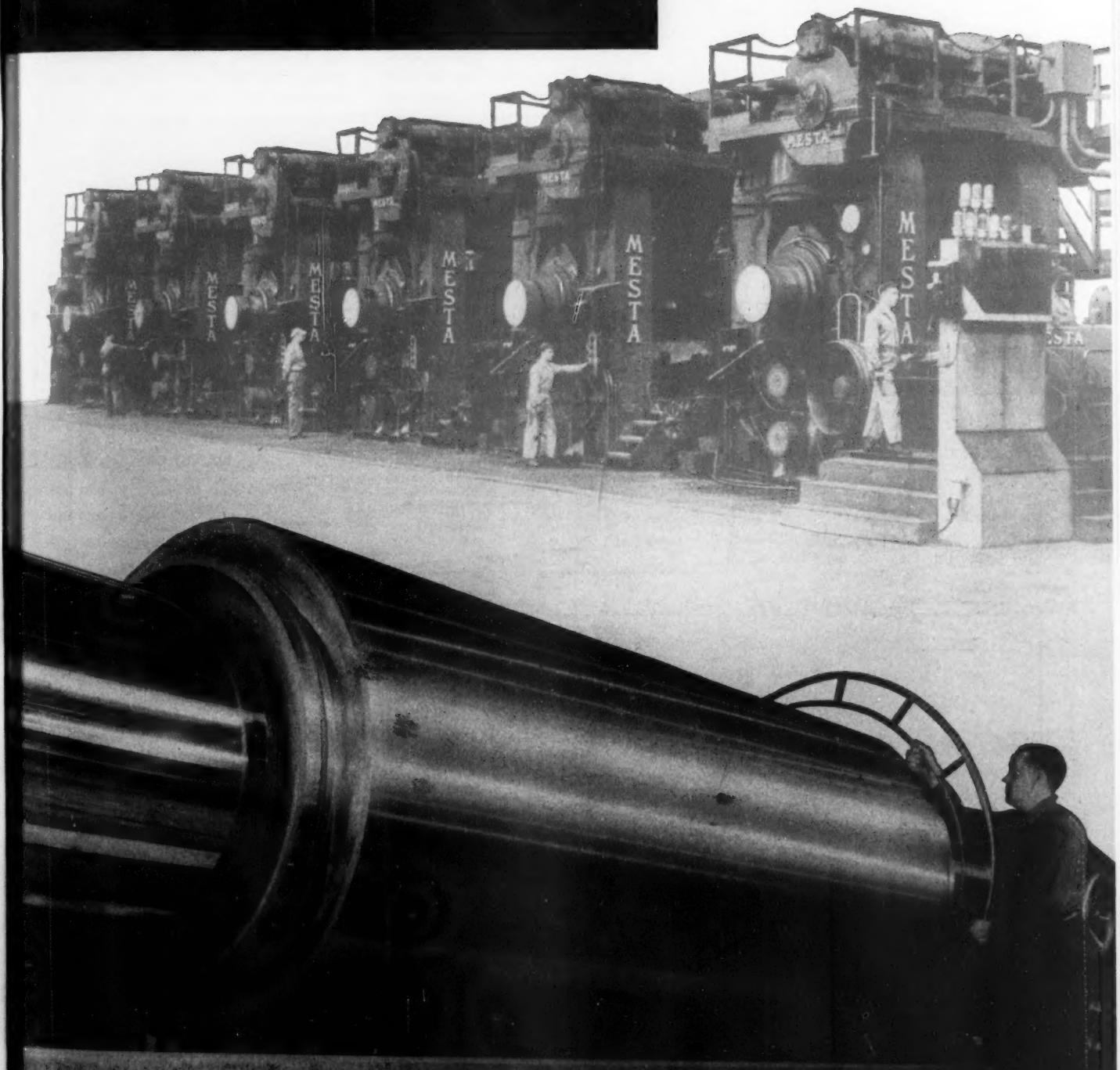

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Eight Simple Tests Separate Stainless Grades

STAINLESS steels exhibiting marked differences in their chemical and physical properties may be separated into the various types by a handy method developed by Carpenter Steel Co., Reading, Pa. Although comprised of a series of eight simple tests, the method is not intended to take the place of an exacting chemical analysis.

In formulating the procedure, the company assumes that the operator making the tests possesses some degree of technical knowledge of the alloys in question. A comparison with known standards is recommended. If it becomes necessary to obtain and use the exact amount of alloys present in a piece of steel, the only safe procedure is to have a chemical analysis made.

In preparing the samples for the identification tests, it is very important that the specimens be free from scale, which may be removed by pickling or grinding. In making a spot test, it is always necessary to grind a fresh area before applying the solution.

By noting these test procedures and following the diagram below, it is possible to identify all of the stainless types listed in the table:

Nitric Acid Test—Solution used in the test is made by mixing one part of concentrated nitric acid and one part of water. A drop of the solution, placed on a freshly ground spot on the specimen, should show a boiling action or gas evolution from the drop if attack takes place.

Magnet Test—Austenitic stainless steels, or 18-8 types, are nonmagnetic in an annealed condition, but become slightly magnetic when cold-worked. This slight magnetism is easily distinguished from the stronger magnetism of the straight chromium types.

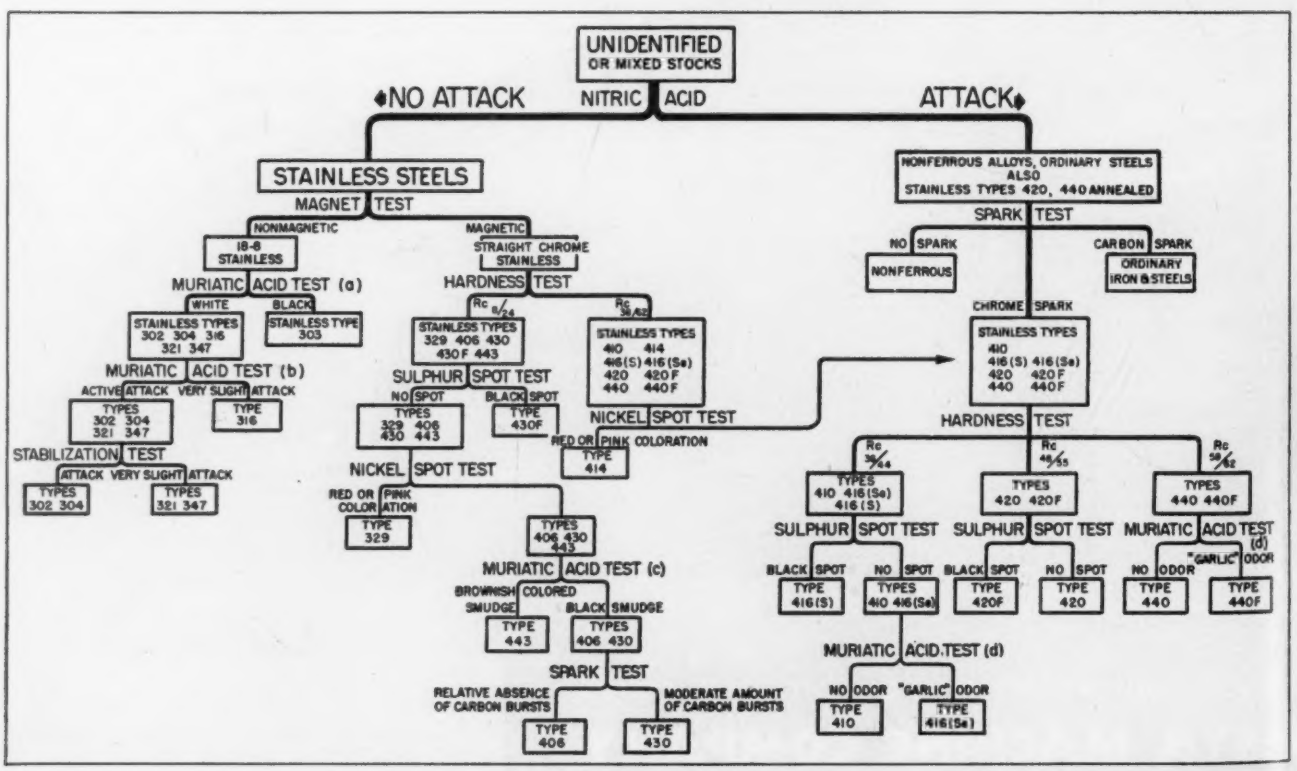
Spark Test—This is made to separate stainless types 420 and 440 from nonferrous alloys and ordinary iron and steel, as nitric acid (under certain conditions) may attack annealed specimens of some stainless types. Characteristic short chromium spark identifies these types.

Hardness Test — Specimens are heated to 1850° F and quenched in oil. Various carbon percentage ranges will be noted by different hardnesses as quenched. The nonhardening types will show low hardness as oil quenched from 1850° F.

Muriatic Acid Tests—A solution of muriatic acid (one part water, one part acid) at a temperature of 180 to 190° F is used for these tests. A fresh solution should be used after each of these tests: a. After a 5-

AISI STAINLESS STEEL CLASSIFICATIONS

Type No.	Carbon	Chromium	Nickel	Other Elements
302	Over 0.08/0.20	17.00/19.00	8.00/10.00	Mn 2.00 Max
303	0.20 Max	17.00/19.00	8.00/10.00	Mn 2.00 Max; S or Se 0.07 Min; Mo 0.60 Max
304	0.08 Max	18.00/20.00	8.00/10.00	Mn 2.00 Max
316	0.10 Max	16.00/18.00	10.00/14.00	Mn 2.00 Max; Mo 1.75/2.50
321	0.10 Max	17.00/19.00	8.00/11.00	Mn 2.00 Max; Ti 4 x Carbon Min
329	0.20 Max	23.00/28.00	2.50/ 5.00	Mo 1.00/2.00
347	0.10 Max	17.00/19.00	9.00/12.00	Mn 2.00 Max; Cb 8 x Carbon Min
406	0.15 Max	12.00/14.00		Aluminum 3.50/4.50
410	0.15 Max	11.50/13.50		
414	0.15 Max	11.50/13.50	2.50 Max	
416	0.15 Max	12.00/14.00		S or Se 0.07 Min; Mo 0.60 Max
420	Over 0.15	12.00/14.00		
420F	Over 0.15	12.00/14.00		S or Se 0.07 Min; Mo 0.60 Max
430	0.12 Max	14.00/18.00		
430F	0.12 Max	14.00/18.00		S or Se 0.07 Min; Mo 0.60 Max
440	Over 0.12	16.00/18.00		
440F	Over 0.12	16.00/18.00		S or Se 0.07 Min; Mo 0.60 Max
443	0.20 Max	18.00/23.00		Cu 0.90/1.25



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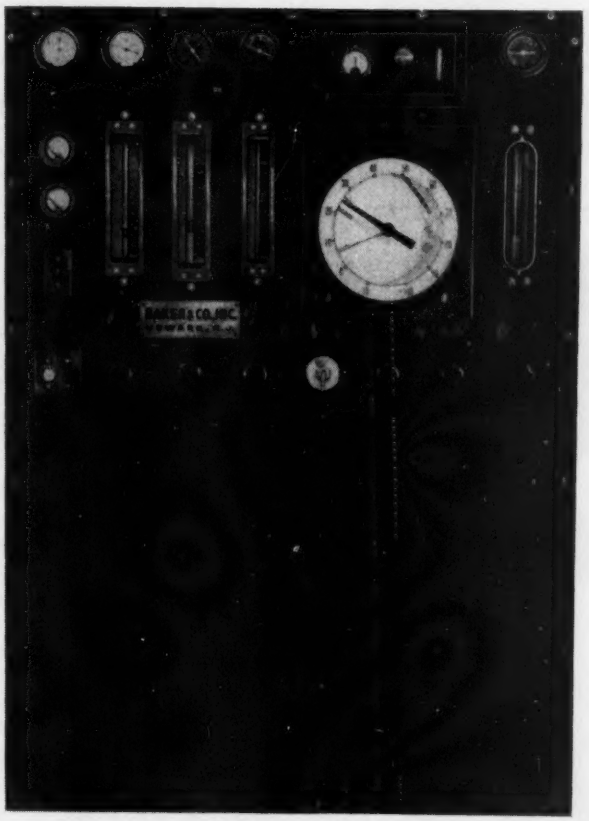

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minute immersion, type 303 stainless is coated with a heavy black smudge; b. within 2 minutes after immersion, type 316 is identified by a very slight acid attack as compared with the active attack and evolution of gas on types 302, 304, 321 and 347; c. immerse specimens for at least 15 minutes, after which type 443 is identified by a brownish colored smudge; d. remove specimens from the solution after a 5-minute immersion in a separate container. A pungent and garlic-like odor is detected on types 416 (Se) and 440F, it being the characteristic odor of hydrogen selenide gas which is not present in pickling types 410 and 440.

Sulphur Spot Test—Three drops of a sulphuric acid solution (one part acid, three parts water) are placed on a newly ground spot on the specimen and allowed to react for 1 minute. One drop of a 5 per cent solution of lead acetate in water is then added to the acid drop and allowed to react for 15 seconds. After the spot is washed with water, examination should reveal the presence of a black sulphide deposit on stainless types 416 (S), 420F and 430F.

Nickel Spot Test—It is necessary to have three solutions for this test: 1. Mix 125 cc water, 100 cc concentrated nitric acid and 25 cc 85 per cent phosphoric acid; 2. one part water and one part muriatic acid; 3. dissolve 1 gram dimethylglyoxime in 60 cc glacial acetic acid. To this solution add another solution, prepared by dissolving 10 grams ammonium acetate in 30 cc ammonium hydroxide. Procedure: After allowing one drop of solution No. 1 to react on a newly-ground spot for 30 seconds, one drop of solution No. 2 is added. After being allowed to react for another 30 seconds, it is absorbed with white blotting or filter paper. One drop of solution No. 3 is then placed on the moist spot of the paper. Formation of a red or pink coloration in the spot denotes the presence of nickel.

Stabilization Test—After heating test specimens to 1250° F for 2 hours, they are furnace cooled to 800° F, then cooled to room temperature in air. Specimens are then placed in a cold solution of three parts nitric acid, one part hydrofluoric acid and six parts water and left for 1 hour. After this time has elapsed, they are removed and washed with water. Stainless types 321 and 347 will show a very slight attack from the acid, while types 302 and 304 will have rough, granular surfaces.

HOPPER DONS A MUFFLER: To keep coal flowing to boiler furnaces in below-zero winter weather, the outlet tip of this 120-ton rooftop hopper has been insulated and steam-heated. At Stauffer Chemical Co., Niagara Falls, N. Y., copper tubing is helically wound around the outside of the hopper tip to carry steam at 340° F. Maximum heating value is obtained from the steam, and heat waste to atmosphere is minimized by encasing the tip in a mineral wool blanket covering. Over the mineral wool is applied a layer of insulating cement, a coat of fibrated asphaltic emulsion and a prime coat of aluminum paint

Cold Tests Bearing Lubricants

LUBRICANTS for ball bearings and such applications as aircraft gun turrets must be effective at temperatures as low as −65° F. To simplify testing of such lubricants, General Electric Co., Schenectady, N. Y., has developed a compact, semiportable device for the low temperature testing of ball bearing lubricants which does not require the use of elaborate cold rooms.

Heart of the device is a cooling chamber resembling a large bucket with a smaller bucket inside, both covered by a transparent plastic lid. Dry ice is placed in the space between the buckets. In testing, a ball bearing is placed on a spindle in the inner bucket and rotated by a small electric motor. Tendency of the outer ring of the bearing to move with the inner ring is measured by a strain gage. If a lubricant under test thickens in the cold atmosphere, the inner ring will not turn freely and the gage will register a greater strain on the outer ring.

New Carbide Possibilities

LIMITATIONS which previously existed as to the shapes and forms in which parts could be economically produced from cemented carbide have, in many cases, shown recent advances, according to Carboloy Co. Inc., Detroit. Among the parts not previously considered feasible on the basis of economy, but now made, are wear-resistant parts, embossing dies carrying considerable minute and sharp detail lettering and trademark stamps. In an application on coal pulverizer blades for industrial stokers, it is reported 22,000 tons have been passed without appreciable wear, as compared with previously 3500 tons for conventional blades.

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Phosphorus Alloys Used in New Plating Method

Bureau of Standards' new process for electrodepositing alloys of phosphorus with cobalt or nickel appears to have commercial possibilities. Easily deposited, the alloys are hard, corrosion-resistant and bright

ELECTRODEPOSITS of cobalt or nickel alloyed with as much as 15 per cent phosphorus are being produced by a commercially feasible method recently developed by the Bureau of Standards. The new phosphorus alloys are said to be more easily deposited than chromium. They are very hard, corrosion-resistant and bright.

These properties suggest the possibility of a number of commercial applications. Their use is indicated for gages, cylinder walls, piston rings and other machine parts where resistance to wear is an important factor. In this connection, the more rapid rate of deposition as compared with chromium and the better throwing power of the plating bath should be of considerable advantage. Although the phosphorus alloys are not as white as bright nickel, the operation of the baths is much less critical than for proprietary bright nickel. The phosphorus alloys can be plated from a bath made up entirely of inorganic chemicals whereas bright-nickel plating solutions must contain an organic brightening agent.

Baths Simply Prepared—Plating baths for depositing the phosphorus alloys are simply prepared, consisting of common nickel or cobalt salts such as the sulphate or chloride, to which is added phosphorus acid as a source of phosphorus in the deposit. Baths are operated at a low pH—between 0.5 and 1.5 depending on the composition.

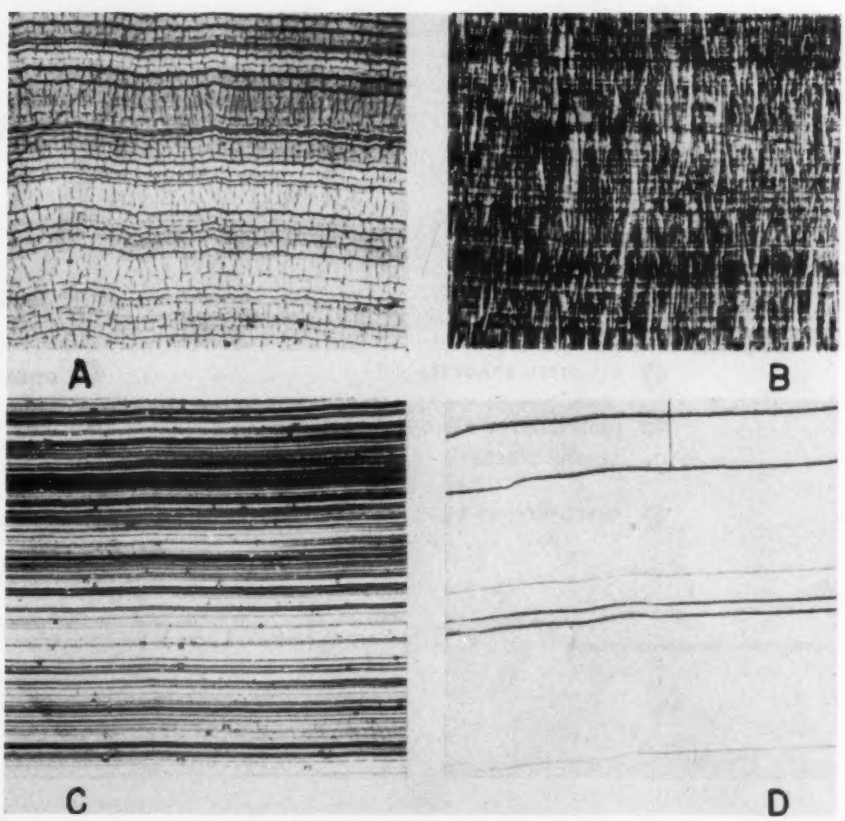
To maintain the desired acidity in the cathode film, the solution must be buffered. The bureau has found that phosphoric acid is one of the best chemicals for this purpose. Plating baths are kept at 75° C or above because at room temperature the cathode current efficiency is very low and the deposits are weak. Current densities should be between 5 and 40 amp per square decimeter. At the usual current density—about 10 amp per square decimeter—the rate of deposition is fairly high, amounting to a few thousandths of an inch an hour.

Phosphorus Content Sets Appearance—Appearance of deposits depends upon phosphorus content. Alloys with less than 2 per cent phosphorus are usually smooth with a mat finish; but as the percentage of phosphorus increases, they become brighter, reaching a peak of brightness at a phosphorus content of about 10 per cent. When such deposits are plated on a dull surface, they increase in brightness as they become thicker. As a result of the slightly dark cast of the high-phosphorus alloys, their reflectivity is 45 to 50 per cent, as compared with about 60 per cent for buffed nickel coatings.

When some of the phosphorus alloys are immersed momentarily in a solution of an oxidizing agent, such as ferric chloride, or made anodic in the plating bath, a jet black film is formed on the surface of the metal. This film is hard and adherent and appears to have possibilities for decorative use.

Photomicrographs of the low-phosphorus alloys show a columnar structure while the high-phosphorus alloys are found to have a laminated or banded structure. X-ray diffraction patterns of the high-phosphorus alloys show no crystalline structure. When heat-treated, the deposits develop a fine-grained structure instead of the large crystals characteristic of pure nickel or cobalt.

Hardness Varies—Hardness of the deposits as plated varies from 350 to



Photomicrograph of alloys of phosphorus with cobalt and nickel electrodeposited by means of the new technique. Low-phosphorus alloys show a columnar structure; structure of the high-phosphorus alloys is laminated or banded. (A) Low-phosphorus nickel (2.3 per cent phosphorus); (B) low-phosphorus cobalt (2.2 per cent phosphorus); (C) high-phosphorus nickel (13 per cent phosphorus); (D) high-phosphorus cobalt (10 per cent phosphorus). Magnification X275

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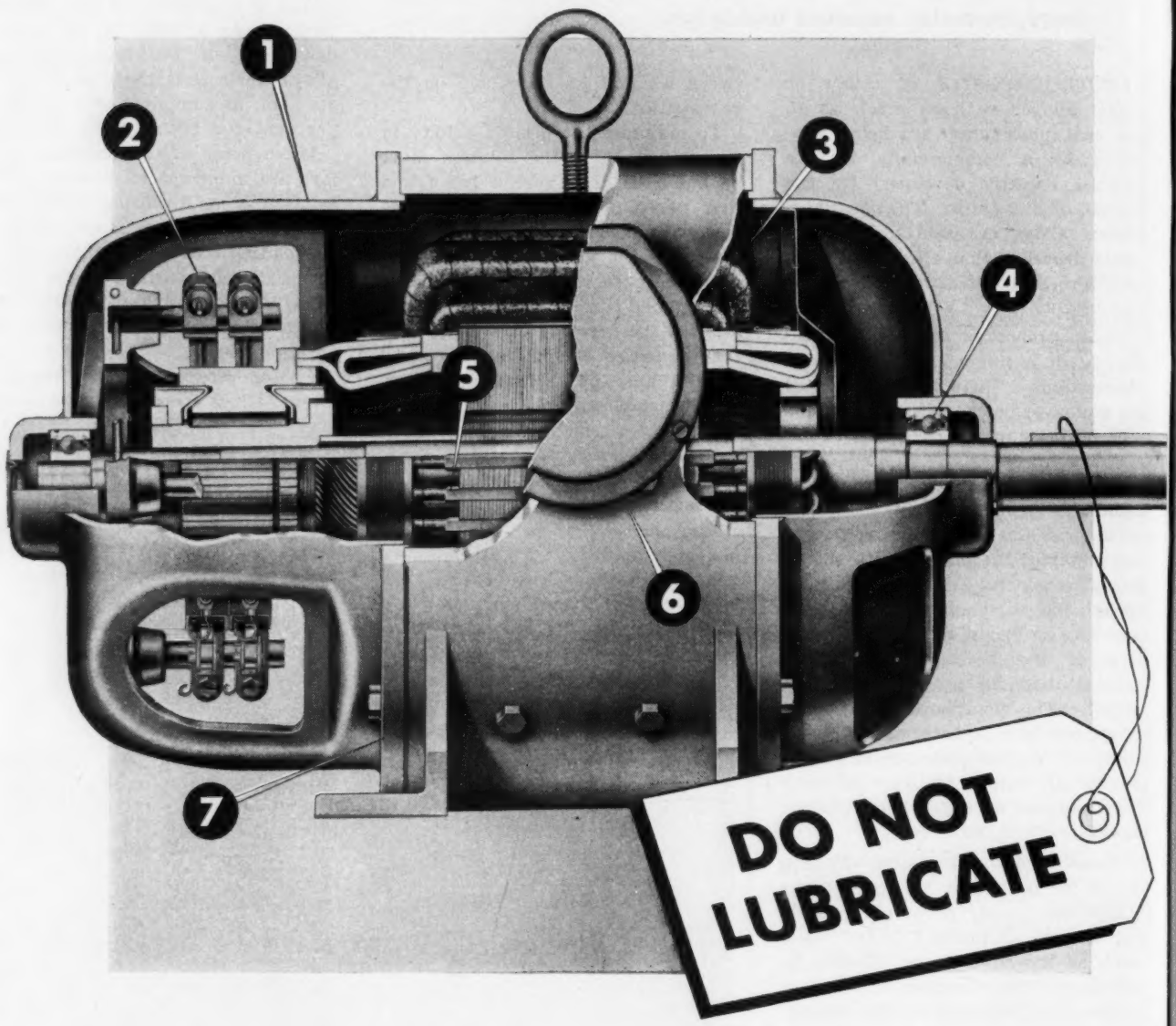

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720 on the Vickers scale, increasing with phosphorus content. When the alloys are heat-treated at 400° C, they become much harder. For example, a heat-treated cobalt-phosphorus deposit containing about 10 per cent phosphorus reaches a hardness of over 1100 Vickers, which is greater than that of electrodeposited chromium. Deposits which have been heated as high as 800° C and cooled are not appreciably softer than the initial deposit. However, the alloys have poor "hot hardness" and above a temperature of 600° C are softer than unalloyed nickel or cobalt.

Although the low-phosphorus alloys become ductile after heat treatment at 800° C, deposits containing more than 1 per cent phosphorus are generally brittle. Alloys with higher percentages of phosphorus are highly resistant to corrosion and chemical attack, exceeding in this respect the pure metals. Thus, in experiments at the bureau the nickel alloy with 10 to 14 per cent phosphorus was attacked considerably less by hydrochloric acid than was pure nickel.

Core Blower Produces 350 Half Molds per Hour

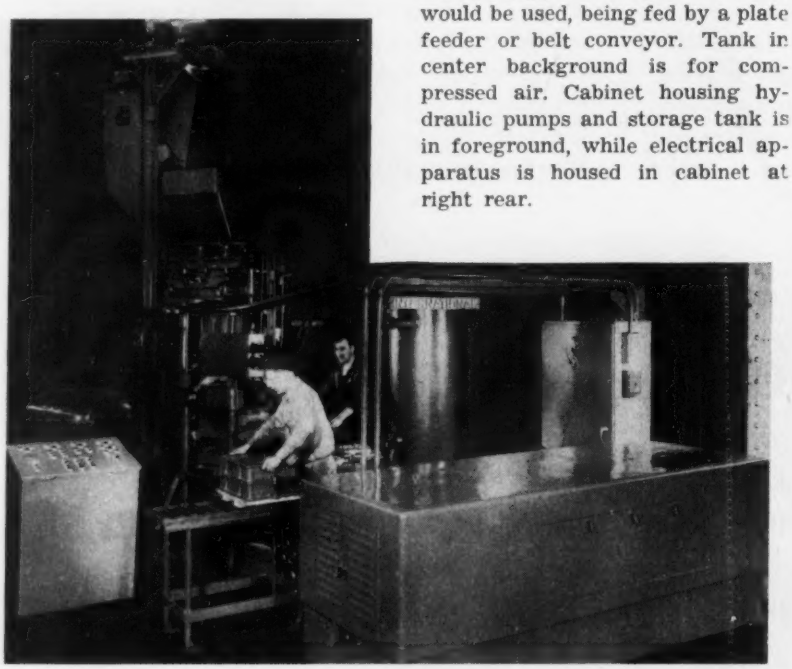
IRON MAN in your foundry might well be a new automatic core blowing machine which is capable of producing 350 half molds per hour. Developed by International Molding Machine Co., LaGrange Park, Ill., the self-contained unit, fills flasks with sand through the use of a blower. The machine, still operating without assistance of the human hand, then indexes to squeeze the filled flask to the correct mold hardness at its next station.

A 72-inch diameter indexing table has five stations, two of which are always empty, allowing for cleaning and spraying of pattern and placing of inserts into the pattern and for the placement of new flasks. The table has pins protruding upward from its surface, these holding five metal pallets at equally spaced intervals. Fitting into recesses in these pallets are special pattern plates. It is said that plates may be removed from pallets and pallets removed from table by lifting, no tools being required.

Sequence of Operations — Flask is placed over pattern on one of the table's pallet boards. Table then indexes to the various stations of mold production, moving the flask to the filling station where standard mix molding sand is blown in. After squeezing at the next station, the table indexes and the pattern is automatically vibrated as a pin pushup drawing operation is performed. Pins hold the mold high, allowing it to be removed from the machine.

Mechanical movements are all hydraulically actuated. Minor clamping cylinders and blowing operation are accomplished through the use of compressed air at line pressure. Machine cycling is by electrical controls.

Machine in accompanying illustration is designed to handle 12 x 18-inch flasks. At the left is the control panel; mold blowing machine itself is in left background. In actual production, a larger sand storage hopper (on top of machine) would be used, being fed by a plate feeder or belt conveyor. Tank in center background is for compressed air. Cabinet housing hydraulic pumps and storage tank is in foreground, while electrical apparatus is housed in cabinet at right rear.



Draws One Corner at a Time

DRAWING or forming of panel corners is an expensive operation. This is particularly true when the fabricator's panel production schedule is not great and where a variety of sizes involves use of welded corners and hand finishing. To place such operations on better footing economy-wise, Vulcan Tool Co. of Dayton, O., has developed a one-corner-at-a-time hydraulic drawing press which is said to eliminate many of the costly die and labor operations usually associated with making paneled corners.

With the use of the Vulcan-Draw press, the flat sheet is placed in position for the drawing of one corner and the operator steps on an actuating pedal. A few seconds in the hydraulic cycle and the sheet is released with the corner completely drawn and finish sized. The other corners are formed by rotating the sheet; upon completion, specified over-all panel dimensions are held. After side and end bending in the usual press brake, the panel is completely formed.

It is said that separate dies are not required for each size panel, thus releasing punch press equipment for other work. As only one corner is processed at a time, various corner radii covering different styled panels can be fabricated in the same equipment. Tooling amounts to a simple single corner punch and die which can be changed at will and within a few minutes if a different shaped corner is to be formed. The company explains that almost any radii and any panel size from 15 x 18 inches to the largest panel handled can be corner-formed from flat sheet.

Foreign Language Edition

COMMERCIAL standard CS90E-47, covering power cranes and shovels, is available in printed form in French, Spanish and Portuguese. It provides uniform methods of supplying specification data, requirements, and definitions for fair competition and a better understanding between sellers and buyers in foreign markets of power cranes and shovels.

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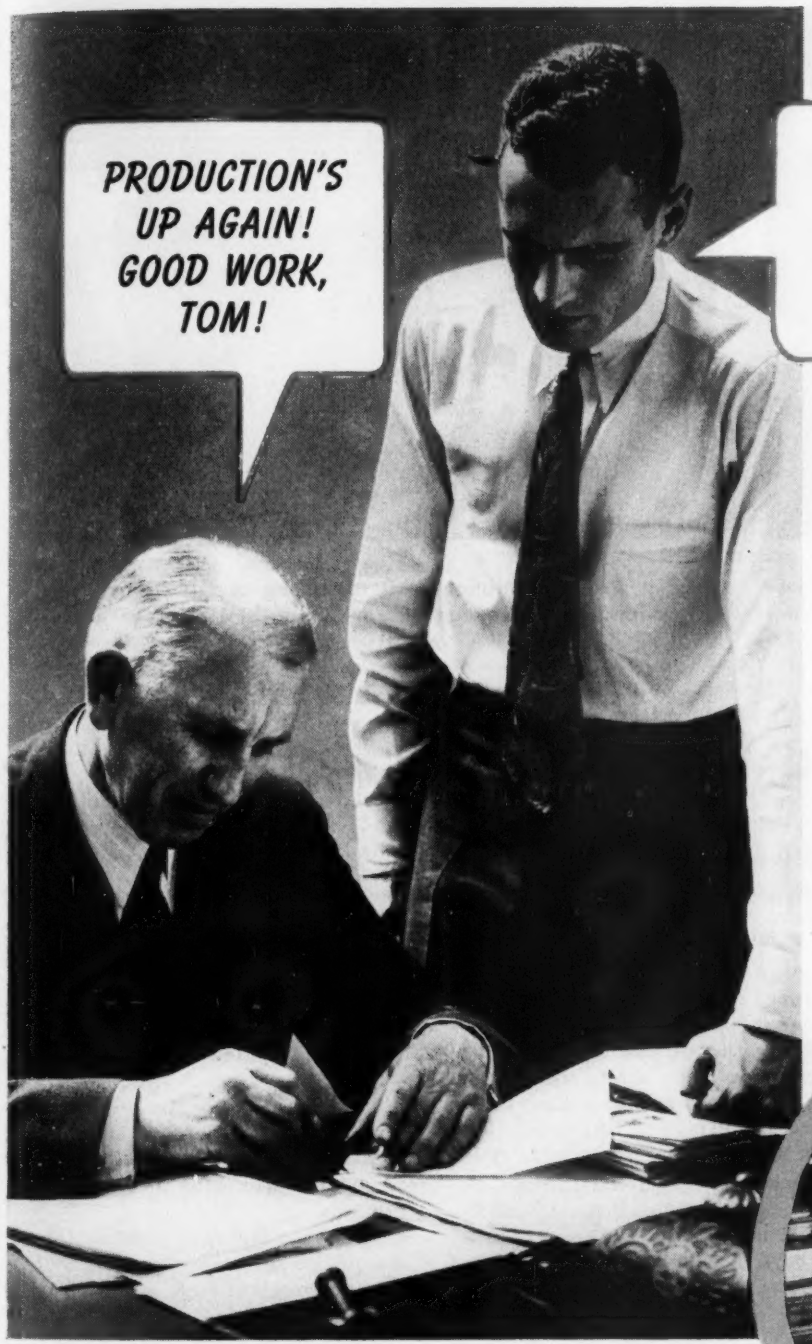

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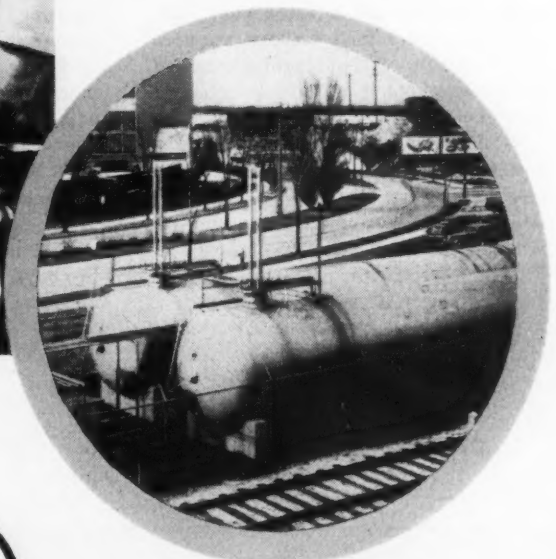

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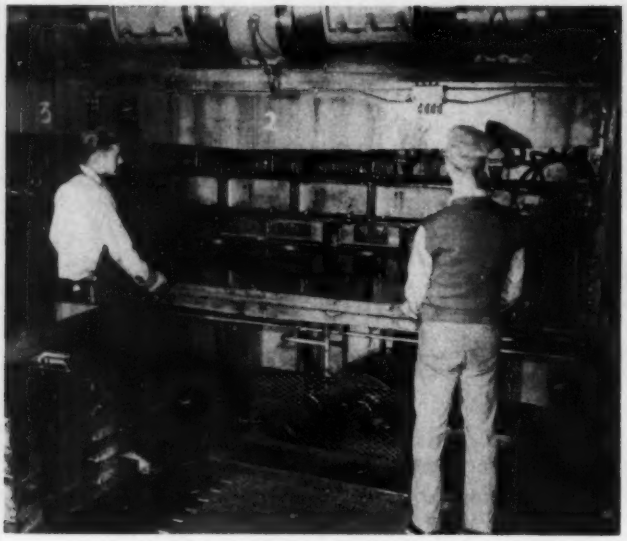


Fig. 1—Sheet metal is fed into a combined slitter and stretcher at the Parkersburg, W. Va., plant of Penn Metal Co. Inc.

Fig. 2—One operation performs slitting and stretching. Expanded metal emerges from the machine with very little or no scrap loss

New Markets Open for Expanded Metal

Now made in heat and corrosion-resistant materials, it combines high utility values with economy in cost

RAPIDLY developing markets for expanded metals in nickel, Monel, Inconel and other nickel alloys are seen as the result of the establishment of convenient and adequate sources of supply.

While largely used for such purposes as screens, where the finer meshes are not required, applications are being broadened to cover such diversified uses as laundry, dish washing and chemical plant equipment, and lathing for anchoring insulation material in steam and other power plants.

Low Fabricating Costs—Many advantages peculiar to the material have been found. For one thing, its cost of fabricating is low. It is produced merely by slitting sheets of the metal or alloy desired and stretching in one operation. There is little scrap loss, most of the original sheet being saved in the expanded metal.

As produced by Penn Metal Co. Inc., Parkersburg, W. Va., expanded corrosion-resistant metal is fabricated without raveling. The material can be formed, curved, welded and assembled. Expanded materials are also made in roll-flattened form when a smooth surface is required.

Good Rigidity, Heat Resistant—Nickel, Monel, Inconel, or other high nickel alloys in expanded form are found to have excellent strength and rigidity as well as resistance to heat, wear and corrosion. The mechanical properties of the materials in sheet form are reported to be further increased by the cold working involved in slitting, stretching and rolling operations.

Expanded Monel is produced in all diamond sizes from ¼-inch through 1½-inch mesh in U. S. standard gage numbers from 22 (0.0306-inch) through 10 (0.1379-inch). Expanded

Fig. 3—The material is roll flattened where an exceptionally smooth surface is desired

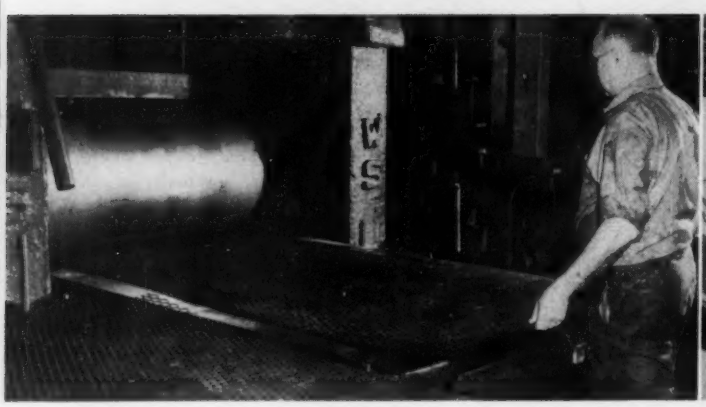
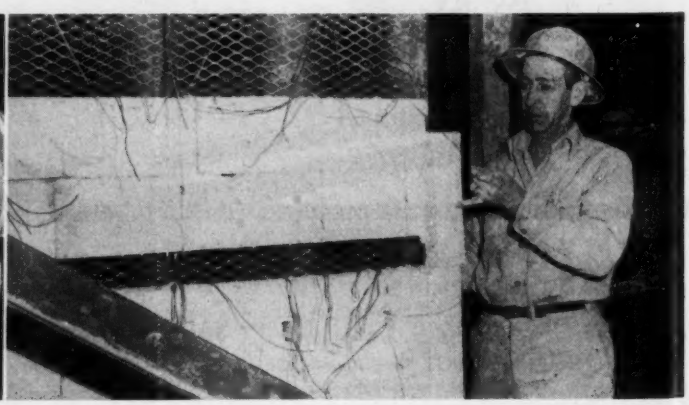


Fig. 4—Expanded Monel being used to anchor Johns-Manville insulating material in a power plant



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Inconel is available in ½-inch mesh in gages 22 through 16 (0.0613-inch), and in ¾-inch to 1½-inch mesh in gages from 20 (0.0368-inch) through 13 (0.0919-inch). The company makes expanded nickel on special order.

Right Method—No Aspirin

Wrought Iron, like all materials, has specific characteristics that require process modifications

PRODUCTION of flanged and dished wrought iron heads can lead to many headaches, but it can be an effortless routine for the fabricator recognizing the inherent characteristics of the metal and introducing slight operating modifications. One large fabricator recently had some difficulty in production of three pairs of flanged and dished heads for a Georgia firm from special forming wrought iron plates supplied by A. M. Byers Co., Pittsburgh. The difficulty, according to E. B. Story, chief metallurgist of the latter company, was traced to failure to modify spinning practice to compensate for wrought iron characteristics.

Job specifications called for two heads ½-inch by 48 inches OD by 48 inches dish radius ASME; two heads ⅝-inch by 48 inches OD by 43 inches dish radius ellipse ASME; and a pair of heads ½-inch by 66 inches OD by 66 inches dish radius ASME. Modifications of procedure called for each head to be heated twice; a considerable reduction of the spinning speed and application of the roller so that the contact between the roller and forming plate is on a greater surface area was also carried out.

Spinning at 1450° F—Plates were heated so that upon being moved from the furnace into the spinning machines, metal temperature was not higher than 1450° F at which spinning began. The operation continued until the temperature dropped to 1100 to 1150° F, at which time the plates still glowed a dull red. They were then reheated to continue forming at not greater than 1450° F temperature at which spinning began.

Another modification of the customary practice was in the playing of the spinning roller in the early stages on the peripheral edge of the plate. In this practice, the roller develops an accentuated localized stress which simultaneously develops compression and tension in the plate. It was suggested that the roller be applied to a greater surface area of the plate, reducing the stress on the forming material. Modification of the roller application procedure is said to have produced two elliptical heads of flawless formation.

Chemical Dries Gas

IN THE PAST, considerable quantities of natural gas have been wasted because of the economic difficulties involved in drying and transporting. Now a chemically-inert solid siliceous material in the form of beads, known as Sovabead, is being used in the commercial drying of natural gas before it is transported through pipelines.

Field tests in the last three years by Socony-Vacuum Oil Co. Inc., New York, has shown that the new chemical doubles the absorption value of drying towers and that the overall operating efficiency of natural gas drying units is enhanced through elimination of caking and reduction of pressure drops, channeling and dusting. Material is said to maintain a high absorption capacity while maintaining the low dewpoint.

Welded Studs Cut Refractory Installation Costs

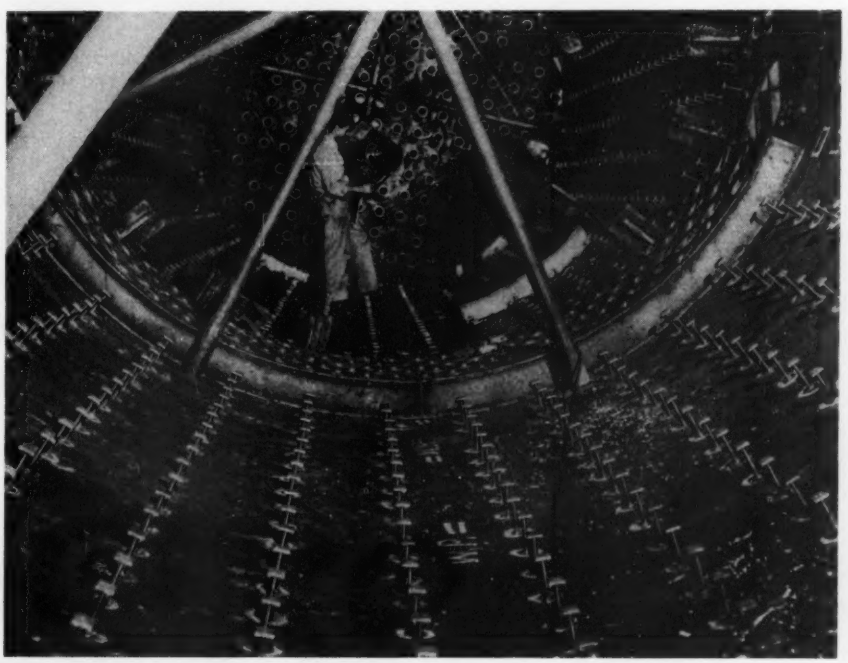
RESULTS expected from use of stud welding for securing refractory tile in pellet catalyst regenerators for a Toledo, O., refinery are lowered installation and maintenance costs and improved equipment operation. Fabricated by Sun Shipbuilding Co., Chester, Pa., for a refinery of Sun Oil Co., the regenerator will have over 5500 pieces of refractory tile which are supported by square headed stainless steel studs.

One end of the special ½ x 4-inch flux-filled AISI type 316 stainless steel studs is welded to a 2-inch square type 316 stainless plate at the plant of Nelson Stud Welding Division, Morton Gregory Corp., Lorain, O. These weldments are shipped to the fabricating company and other end of the stud welded to the inner shell of the catalyst regenerator with the assistance of a special chuck developed for this purpose. Studs are welded to center puch marks laid out during the fabrication of the tank.

Tile Fits Over Studs—Weldments support tongue-and-groove high temperature refractory tile of the type produced by LaClede Christy Co., St. Louis. A special sealing cement is first applied to the tank wall, then 40-pound insulation blocks. Latter are placed on the studs next to the shell. The tongue-and-groove tiles are placed in position over the studs supported by the 2-inch square of stainless steel.

According to the designers and engineers for the project, Catalytic Construction Co. Inc., nearly perfect insulation of the tank wall is achieved. The intimate fit of the insulation blocks behind the refractory tile results in a complete gas seal to minimize the possibility of gas getting behind the insulation and causing hot spots on the tank wall.

Square-headed stainless steel studs, accurately positioned on the lining of the catalyst regenerator support more than 5500 pieces of tile



By E. P. BEST
Metallurgist
A. M. Byers Co.
Ambridge, Pa.

Special Ladle Technique

ELIMINATES 90% OF SULPHUR IN IRON

Desulphurizing practice followed by A. M. Byers includes preconditioning the desulphurizer by simultaneously raising it to the metal temperature while degasifying it to eliminate foaming. Three ladles, one of which is hooded, are employed in the procedure

ELIMINATION of 90 per cent or more of the sulphur in iron now is being accomplished at the Ambridge, Pa. plant of the A. M. Byers Co. by using a special ladle treatment with sodium hydroxide prior to bessemerizing. The desulphurizing practice consists of the following operations:

About 28,000 pounds of hot metal is initially tapped from a battery of three cupolas melting at the rate of about 55 tons per hour. This amount of metal is tapped into an open top conventional lip pour ladle which rests on a truck. As the metal fills the ladle the weight is obtained by suitable scales, and three or four 100-pound cans of sodium hydroxide as required are simultaneously added at spaced intervals during the tap. The sodium hydroxide melts to form the desulphurizing slag. The reaction is violent; the slag becomes foamy and more or less quiet only after the completion of tapping.

This ladle of hot metal with an overlying layer of desulphurizing slag, which also is the rear ladle in a train of three, is coupled to the train and pulled into position under a suitably located crane which can pick it up and pour its contents slowly and deliberately into an empty hooded type ladle. Metal and slag go over the lip together and further intimate mixing is provided whereby the unprecedented in sulphur reduction is secured. The emptied ladle is placed back on its own truck and returned to the cupola tapping station to receive the next heat.

The hooded top ladle, which is the middle ladle in the train, is then picked up by the crane, its truck moved into the clear, and a third ladle, also a conventional lip type ladle on its truck, is pulled into position under the hooded top ladle to receive the desulphurized heat. This third ladle, which is the forward ladle in the train, is then in position on a second set of scales, and a converter charge of 27,000 pounds of desulphurized hot metal is received from the hooded ladle for transfer to the converter. The hooded ladle then is returned to its truck ready for the oncoming heat.

The hooded top ladle is provided with a nozzle situated at about a position which would correspond to the lip of the conventional ladle so that when the ladle is tilted the nozzle functions similarly to a bottom pour ladle. Only a small shot of slag is ejected as it passes the nozzle on the way "up and down", and by means of this arrangement the desulphurizing slag can be separated from the desulphurized metal and the desulphurizing slag is retained in the hooded ladle.

With each cycle of operations additional desulphurizing slag accumulates in the hooded type ladle. In order to prevent excessive build-up of sulphides in the desulphurizer through prolonged reusage, some of the accumulated desulphurizing slag in the hooded type ladle is poured off, preferably after each cycle. After the second heat has been handled, only a portion of the reused slag will be involved in successive heats as the cycle of operations is repeated.

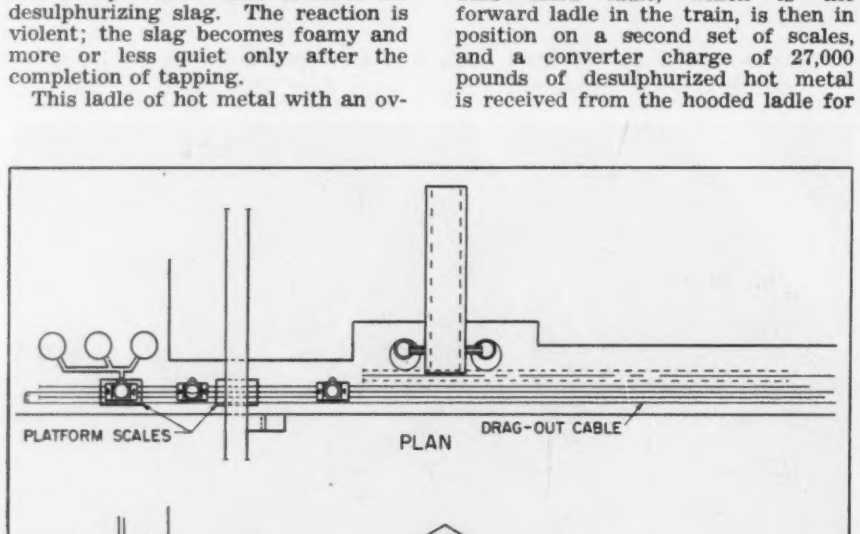


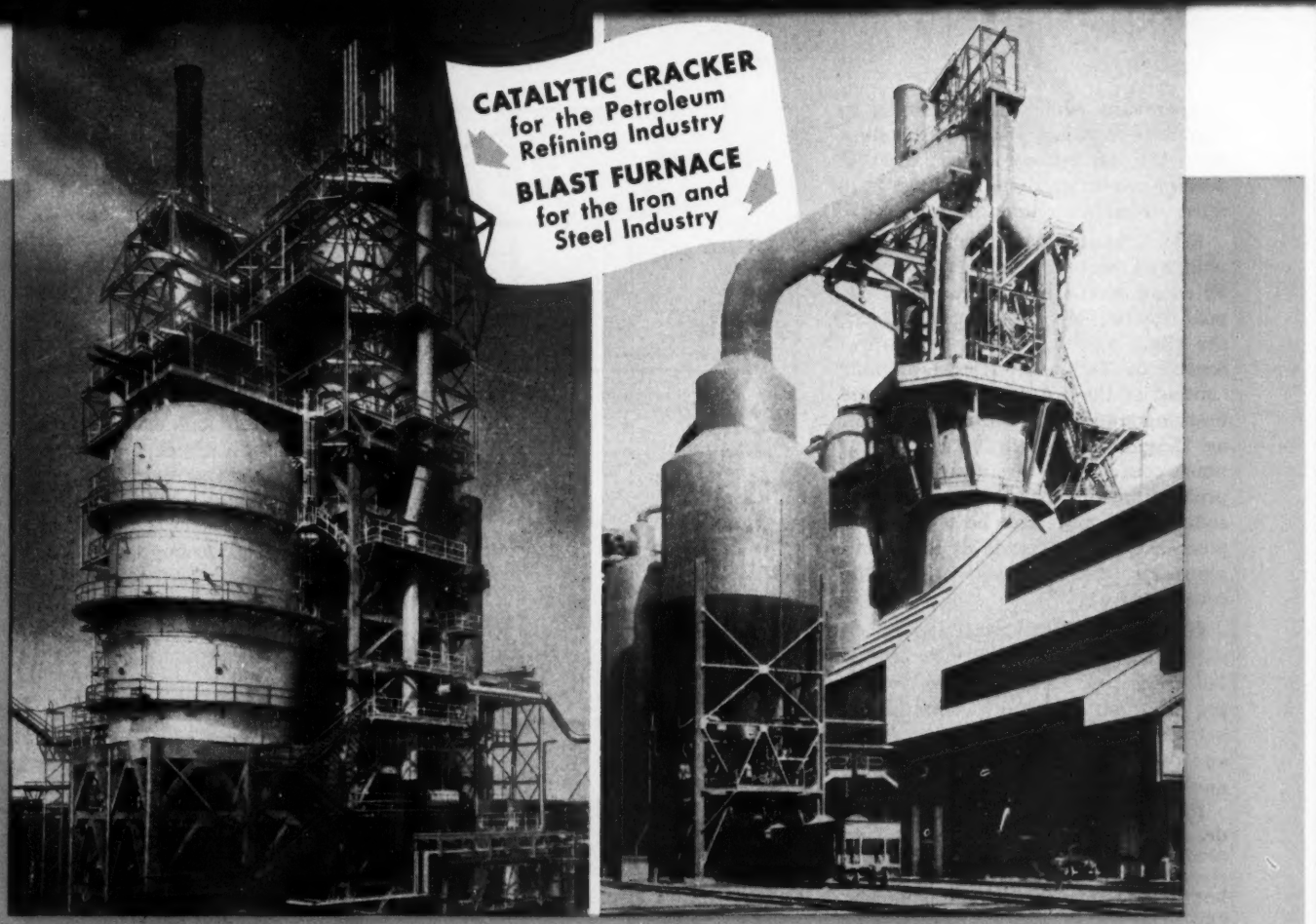
Fig. 1—Plan and elevation view of desulphurizing equipment

Desulphurizing Procedure—The mechanical arrangement used in the perfected desulphurizing procedure is illustrated diagrammatically in plan and elevation by Fig. 1. A sketch of the hooded ladle is shown in Fig. 2; its design is unique and its operation simple.

Summarizing the metallurgical accomplishment briefly:

1. In the initial ladle the solid desulphurizer is melted and some of the sulphur removed.
2. In the second ladle an additional quantity of the remaining sulphur is removed and the slag mechanically skimmed.
3. The third ladle merely provides a receptacle for transporting the fully desulphurized iron to the converter for blowing.

This new method features the preconditioning of the desulphurizer by simultaneously raising it to the metal



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temperature while degasifying it to eliminate foaming, and then reladling it to provide intimate association of desulphurizer and metal under the most effective circumstances.

Effectiveness of the present desulphurizing method can be illustrated by citing several specific cases for cupola melted hot metal taken from the plant records. The data are presented in Table I. If the sulphur content of the hot metal intended for bessemerizing is not particularly high or the need for relatively low sulphur content in the desulphurizing product not of paramount importance, sodium carbonate can be used to replace sodium hydroxide as the desulphurizing reagent using the same procedures.

Optimum Commingling Important—Primary essentials for successful ladle desulphurization of molten pig iron are optimum commingling between the reacting hot metal and desulphurizing slag, temperature and absence of contaminants

Recently our activities with ladle desulphurizing made it possible to recognize that the optimum with respect to intimate contact between the hot metal and the desulphurizing agent should be given prime consideration, and since then the improvements reflect this fundamental; intermixing of the two phases by agitation is imperative. In connection with agitation the resultant slag becomes foamy when solid sodium hydroxide is melting in contact with molten iron. The foaminess is caused by the dissociation of water vapor from the hydroxide. It has been found that with this physical condition desirable intimate contact is not fully obtained between metal and desulphurizer. Upon completion of the tap, boiling and foaminess subside, and subsequently during reladling a very effective intimacy between the molten metal and the desulphurizer is thereby obtained. In its essentials some desulphurizing is accomplished in the tapping ladle, but the important accomplishment in the first ladle is a conditioning of the molten desulphurizer to enable it to do the highest degree of desulphurizing when the contents of the tapping ladle are repoured.

Optical readings using customary correction for emissivity show that a temperature range between 2450 and 2650° F is satisfactory for the operation being discussed. The temperature obtained at the Byers plant for any one set of operating conditions depends on the cupola burden, other things being equal. A pig iron burden yields molten iron at the cupola iron notch at the lower value, and with increasing amounts of scrap the temperature rises to the maximum. With the average burden used at the Byers plant, resultant hot metal temperatures are customarily in the 2450-2650° F range.

Temperature loss through desulphurizing is 175 to 200° F, that is, cupola hot metal temperature to desulphurized hot metal temperature entering the converter. It scarcely need be mentioned that speed of operations would be a factor with respect to temperature loss, but it should not be forgotten that hot metal is under discussion and its carbon level is high. The quantity of desulphurizer used within the limits of the 250-400 pounds employed seemingly is not important in the matter of temperature loss; the temperature drop is the same for all practical purposes. Apparently the boiling action in the tapping ladle is the larger factor affecting the temperature loss. The action in the ladle when the sodium hydroxide is being added is violent.

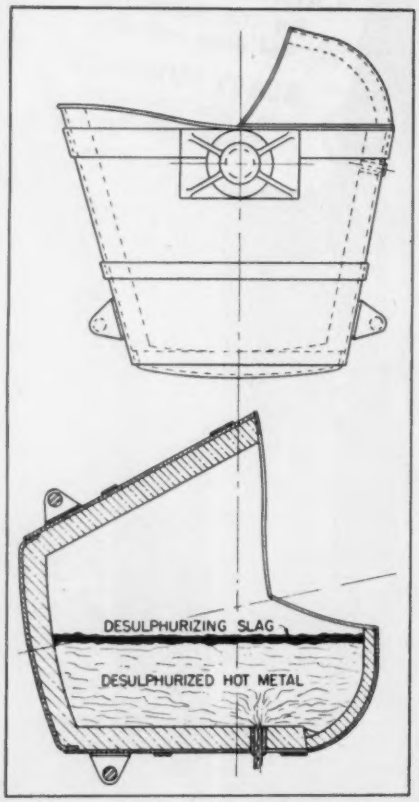

Fig. 2—Sketch of hooded ladle

TABLE I
EFFECTIVENESS OF PRESENT DESULPHURIZING OPERATION
(Cupola Melted Hot Metal)

Hot Metal	Case A	Case B
Silicon, %	1.25	0.75
Sulphur, %	0.11	0.22
Temperature, ° F.	2450	2600
NaOH added, lb	250	400
Quantity treated, lb.	27,000	27,000
Resulting sulphur, %	0.010	.017
Percentage eliminated	90.9	92.3

TABLE II
EFFECTIVENESS OF PRESENT DESULPHURIZING OPERATION
Hot Metal Temperature Range: 2450-2650° F
Sodium Hydroxide: 250 to 400 lb/27,000 lb Hot Metal

Per Cent Sulphur		
Before Desulphurizing	After Desulphurizing	Eliminated
0.111	0.008	92.8
0.138	0.009	93.5
0.156	0.009	94.2
0.165	0.013	92.1
0.181	0.014	92.3
0.190	0.014	92.6
0.211	0.015	94.1
0.227	0.015	93.4
0.235	0.016	93.2
0.269	0.019	92.9

The 175 to 200 degree loss mentioned can be reduced by 50 degrees or more if the plant layout permits the elimination of the third ladle in the train—the transfer ladle. At the Byers plant it was not practical to pour directly from the hooded ladle into the converter, but where suitable means are provided this could be readily accomplished if temperature considerations assumed importance.

Cupola slags are acid and carry between 0.25 and 0.50 per cent sulphur and must not be permitted to become a discounting factor in ladle desulphurizing. The cupolas concerned have cinder notches as well as iron notches. Enough iron is retained in the well to prevent slag draining through the iron hole; if it shows the iron is stopped. What holds true for the cupola slag would apply of course to any sulphur bearing slag.

Hard Ladle Brick Best—The grade of refractory brick employed which has been found to give the best service is hard, dense, clay ladle brick. The life of the ladle brick is considered good; the tapping ladle so-called lasts from 12 to 20 hours; the hooded ladle about 48 hours; and the transfer ladle approximately 72 hours. Hours of service prior to repairing or relining can be translated to any method of comparison by calculating four heats per hour, 27,000 pounds each, as the rate of production. About 1200 to 1300 tons of hot metal are desulphurized each 24 hours.

Composition of the hot metal handled with the desulphurizing operation has varied through the range reported in Table III. Considering the elements individually, it can be stated that carbon must be present; higher silicon is believed advantageous; manganese appears not to matter. Opportunity has not been presented to learn the low limits of carbon and silicon below which desulphurizing becomes impossible; but unquestionably there are limits with respect to carbon and silicon individually and to the sum of the combined carbon and silicon content.

Portrays Changes—Change in hot metal composition during the desulphurizing operation is likewise shown in Table III. As indicated there may be as much as a quarter of 1 per cent drop in carbon shown by analysts. There will be a drop in silicon of 10 to 25 points, depending upon whether the minimum amount of 250 pounds of sodium hydroxide or maximum amount of 400 pounds is used. There will be no change in manganese content and the phosphorus may show a small increase due to the concentration effect of the losses. The difficulty of obtaining a truly represen-

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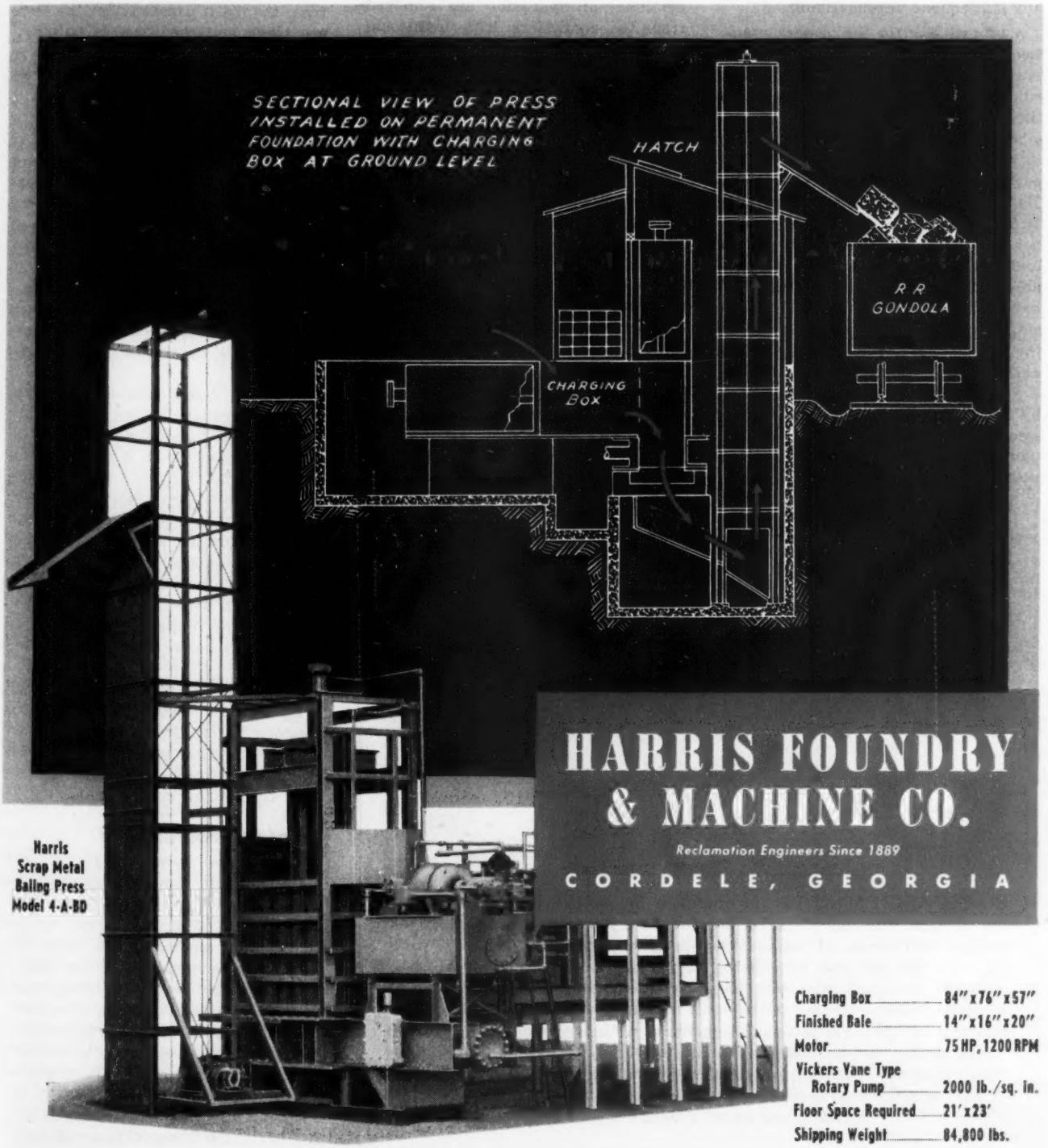
SECTIONAL VIEW OF PRESS INSTALLED ON PERMANENT FOUNDATION WITH CHARGING BOX AT GROUND LEVEL
HATCH
R R GONDOLA
CHARGING BOX

Harris Scrap Metal Baling Press Model 4-A-BD

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Reclamation Engineers Since 1889

CORDELE, GEORGIA

Charging Box	84" x 76" x 57"
Finished Bale	14" x 16" x 20"
Motor	75 HP, 1200 RPM
Vickers Vane Type Rotary Pump	2000 lb./sq. in.
Floor Space Required	21' x 23'
Shipping Weight	84,800 lbs.

TABLE III
HOT METAL CHEMISTRY

	Range of composition Handled	Change in composition during desulphurizing
Carbon (total)	3.25-4.25	25 points or less
Silicon	0.50-2.00	10 to 25 points
Sulphur	0.06-0.36	92+2%
Manganese	0.30-1.00	No change
Phosphorus	0.05-0.13	Slight increase

tative analysis for hot metal should be considered in weighing this data; however, it is believed that the data closely portray actual changes that occur in the hot metal composition for the elements other than sulphur which would have to be considered in any subsequent bessemerizing.

A typical slag for the present practice which includes the reladling operation will analyze 37 to 38 per cent silica and have a sulphur content in the range of 7 to 8 per cent. The silica is believed to be present as Na_2SiO_3 and the sulphur as Na_2S. A 38 per cent silica means 77.3 per cent Na_2SiO_3 and 8 per cent sulphur means 19.5 per cent Na_2S; their sum is 96.8 per cent, and the remainder is FeO and Al_2O_3. This unusual and remarkable slag has a distribution ratio between the percentage sulphur in the slag and the percentage sulphur in the metal which varies between 500 and 550.

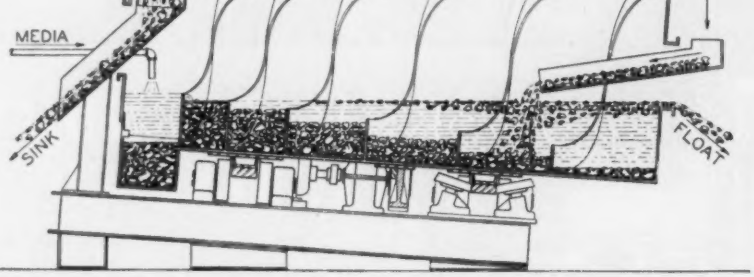
Sodium hydroxide produced either by the ammonia-soda process or the electrolytic process arrives at the plant in carload lots, in airtight 100 pound or 200 pound cans. These unopened cans are delivered to the charging platform. At this point the solid cylinders are removed from the sheet metal containers by cutting along the longitudinal seam and circumferentially around the top and bottom using a hatchet. Once the cylinders of hydroxide are removed from the containers, little additional handling is involved and the workmen merely roll the cylinders through a trap door into the tapping ladle below. Necessary safety precautions are taken; workmen use rubber gloves and face masks. Liberated fumes are suitably handled by enclosed hoods and stacks.

From a paper presented before the Pittsburgh chapter of the American Society for Metals, Feb. 9.

Spiral Tubing by Heliarc

TUBING of almost any diameter and thickness may be easily produced by forming into a closed spiral and welding the joint with a Heliarc torch. Stainless steel, Inconel, plain carbon steel, brass, aluminum and magnesium have been made into spiral welded tubing by B & M Mfg. Co., Grand Rapids, Mich., using a Heliarc torch, developed by Linde Air Products Co. of New York.

Diameters range from ¼ to 3 inches and walls from 0.015 to 0.0625-inch or more. It is said that the forming machines are simple and light and that no heavy equipment or forming dies are used in the process. Advantages reported are the speed and adjustable feature which permits tube of different size and thickness to be welded with only a few adjustments of the forming head and welding machine. Coiled strip of proper width is placed on the forming machine and forced through a die that makes the spiral. As it emerges from the die it passes under the Heliarc torch and the seam is automatically welded. It then may be given a cold draw to produce a perfectly smooth surface.



BENEFICIATION BENEFITS: In operation to improve the grade of iron ore derived from beneficiation are two heavy media separators in the Mesabi iron range of Minnesota. Made by Hardinge Co. Inc., York, Pa., the units, plus four more being installed, consist of a slowly-revolving, inclined, cylindrical drum with spiral flights attached to its inner surface. Material to be separated is fed in at the lower end. Sink-float separation method employs a liquid suspension of heavy mineral, or metal, whose density lies between that of the materials to be separated. The "sink" material is carried by spiral flights to high end and discharged; "float" overflows a circular weir at lower end. Units are capable of handling ore up to 4 inches in diameter

Brushing Cleans Strip Steel

SAVINGS for a large midwestern rolling mill are effected by the application of power brushing for the continuous cleaning of strip steel at speeds of over 1500 fpm. By removing all traces of rolling oil prior to electrolytic tin plating, the Heli-Master brushes, developed by Osborn Mfg. Co., Cleveland, help prevent porous coatings and assure a high quality product.

Assuring continuous and uninterrupted production on the sheet scrubbing line, the brushes are produced in units of length from 4 to 30 inches and in diameter from 8 to 12 inches. As the strip emerges from the squeezer rollers, it passes through the first of three brushing stations. Two sections are mounted on each shaft to provide a 42-inch brush face. Due to the uniform dense fill assured by the special construction, these brushes are said to insure against streaking or gaps.

Operating in conjunction with high pressure hot sprays and chemical cleaning baths, the brushes rotate at 1200 rpm. After scrubbing, the sheet is coiled and proceeds to the electrolytic tin plating operation.

A Career in Metallurgy

TAKING the young science student through swift moving and dramatic series of facts, from the ancient hammering-out of metal forms to the sound of a supersonic jet plane is a 30-minute recording of "Your Career In Metallurgy" available from American Society For Metals, Cleveland. Making use of radio programming techniques, the recording is intended to clarify metallurgy in the minds of those who want an engineering career, but who have not decided upon the particular branch they will enter.

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Surface Finish

(*Continued from Page* 90)

Most widely used method of absolute surface finish comparison is the stylus-type instrument. In fact, it was not until after the instrument-makers developed the direct reading roughness measuring instrument that any attempt was made to standardize the terms and methods of designating surface roughness. Use of instruments of this type has made possible the designation of surface roughness as a linear measurement of the depth of the roughness.

When well calibrated, the instruments are capable of extremely accurate measurement. Such instruments have indicated the variations that normally occur on ordinarily machined surfaces. Their use eliminates some of the dependence of the roughness readings on the personal interpretation of the inspector when compared to the use of standard specimen sets. In addition to identifying the degree of roughness by a number, certain present day instruments are capable of producing a graph of the profile of the roughness and the contours of the waviness encountered.

Surface Finish Terminology — Standardization of surface finish terminology was not attempted before adequate means of measuring surfaces had been developed. After numerous meetings and preliminary publications, the present American Standards Association B46.1 standard on surface roughness, waviness, and lay was adopted in February, 1947. The Society of Automotive Engineers' standard on surface finish, which is patterned largely on the ASA B46.1 standard was adopted in March, 1949.

The standards do not define the means by which a surface is to be produced, nor by what methods the surfaces shall be measured. Further, the standards are not concerned with the physical or optical characteristics of the surface. They are concerned only with the geometrical irregularities of the surface and their direction.

Given below are definitions pertaining to surface finish control as described in General Motors Engineering Standards:

Surface: The surface of an object is the boundary which separates that object from another substance. Its shape and extent are usually defined by a drawing or descriptive specification.

Profile: The contour of any specified section through a surface.

Roughness: Relatively finely spaced surface irregularities. On surfaces produced by machining and abrasive operations, the irregularities produced by the cutting action of tool edges and abrasive grains, and by the feed of the machine tool are roughness. Roughness may be considered as being superimposed on a "wavy" surface, but in itself does not alter the trueness of the surface.

Microinch: One millionth of an inch. 0.000001-inch.

Unit of Height for Roughness

Lay: Direction of the predominant surface pattern.

Waviness: Surface irregularities which are of greater spacing than the roughness. On machined surfaces such irregularities may result from machine or work deflections, vibrations, etc. Irregularities of similar geometry may occur due to warping, strains, or other causes.

Flaws: Irregularities which occur at one place, or at relatively infrequent intervals in the surface, e.g. a scratch, ridge, hole, peak, crack or check.

Methods of Rating Roughness—The ASA standard allows four different methods of rating surface roughness, namely, maximum peak to valley height; average peak to valley height; root mean square of deviations from the mean surface; and arithmetical average of deviations from the mean surface. It was purposely broad to allow for varied opinions of the different factions involved. The SAE standard on surface finish rates roughness as arithmetical average deviation from the mean surface only.

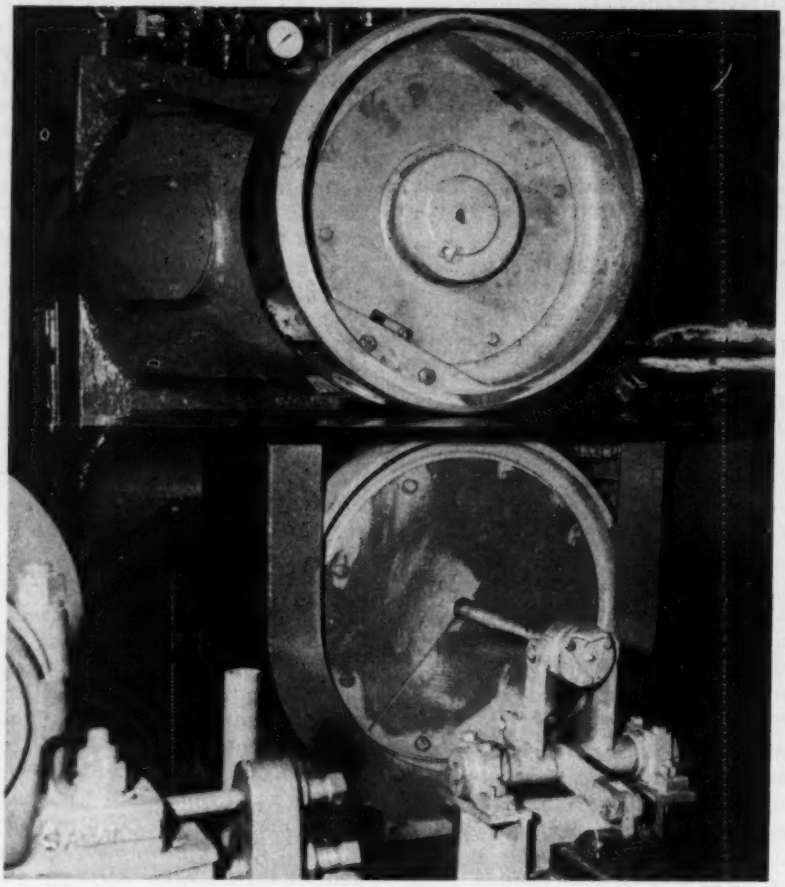
Because of the indefinite concept of what constitutes a peak and what constitutes a valley, deviation from the mean surface was chosen. Since it integrates highs, lows and intermediate values of roughness, it provides a figure that is more of an overall gage of the surface than the peak to valley measurements. Averaging-type instruments usually read some function of the deviation from the mean surface.

At present, the gage reading of most stylus-type instruments rate roughness in root mean square values, but these instruments can be adjusted to read the arithmetical average with very little effort.

The ASA standard allows measurement of roughness values by comparison with reference surfaces or by direct instrument measurements. Comparison can be made by sight, feel, or instrument. The SAE standard recommends that all roughness measurement be based on a set of standard surfaces, the values of which are the same from set to set. Instruments may be used for direct measurement if they have been calibrated against the standard surfaces; visual or tactual comparisons are best made by employing pilot specimens of the surface to be measured.

Surface Point Analyzers—Develop-

REDUCES SPACE REQUIREMENTS: This outside storage is part of recently instituted material handling procedure at Pfaudler Co., Rochester, N. Y., which saved 10,000 sq ft of floor space within the plant. Four Towmotor industrial trucks increased manufacturing floor space, utilized storage space 100 per cent and cut handling costs drastically. In one department, use of a 4000-pound capacity truck reduced required floor space by 6000 sq ft, yet twice the material is stored—with the aid of pallets and loading racks. Actual dollar savings throughout the plant total almost four times the cost of the four trucks



SAMPLE ON THE FLY: Exactly synchronized at all times with the movement of the strip is this flying sample punch installed on the No. 4 electrolytic tinplate line at Weirton Steel Co., Weirton, W. Va. (see STEEL, May 15, 1950, p. 104). Made by United Engineering & Foundry Co., Pittsburgh, the punch is designed to cut samples out of strip steel 0.005 to 0.036-inch thick running at speeds up to 2000 fpm. Upper drum has fixed die and lower drum a movable punch which is extended by a solenoid acting through toggle linkage inside the drum. Machine is made to move across strip, making it possible to obtain a sample at any point across width

ment of surface point analyzers has contributed a great deal to the advancement of surface quality control. The Profilometer manufactured by Physicists Research Co., Ann Arbor, Mich., and the Brush surface analyzer produced by Brush Development Co., Cleveland, are tracer point surface finish measuring instruments. The specific quality measured by these instruments is roughness, which, together with waviness and flaws are generally supposed to comprise the irregularities found on a surface. The instruments use an electric "pick-up" to trace the irregularities and to convert these mechanical fluctuations into corresponding electrical ones. The instrument amplifier then magnifies these fluctuations until they are powerful enough to actuate a meter. The meter reading thus produced represents the average surface roughness of the part being measured.

The reading produced by the Profilometer can be described as the average departure from the "center line." That is, the surface to be measured should be pictured as a series of hills and valleys and a center line should be drawn halfway between the peaks and valleys—the Profilometer reading represents the average distance between the center line and the line denoting the surface.

The Brush surface analyzer is another type of surface point analyzer which, according to Brush Development Co. has been used for the exploration and charting of surface finishes on metals, glass, wire, plastics, paper, plated and painted surfaces, and tool cutting edges. A typical shop set-up of the instrument is shown in Fig. 17. Application of the Brush surface analyzer to the study of plated and unplated surfaces has recently been described.[5]

Surface defects in base metals have long been among the chief factors contributing to high finishing costs. Electroplaters have long recognized the desirability of securing a process which would plate heavier-than-average deposits into surface defects and thus tend to "smooth" the surface during the plating process. The advent of tools for examining surface smoothness, such as those of the surface point analyzer type have assisted in the development of plating processes which tend to minimize surface imperfections.

(To be concluded)

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3. Broadston, J. H.—*Instruments* 20, 376 (1947)
4. Illustrations prepared by Physicists Research Co., Ann Arbor, Mich.
5. Miller, R. D., and DuRose, A. H.—Proc. Am. Electroplaters' Soc. (1947). Also, Wilson, K. S., and DuRose, A. H.—*Plating* (March 1949)
6. Herschman, H. K.—J. Research Nat. Bur. Standards 34, 25 (1945)
7. "Faxfilm" is one type of plastic replica film supplied by Rex D. McDill, 5109 Mayfield Rd., Cleveland, Ohio.
8. Mather, K. B., *Metal Progress* (Aug. 1949)

Furnace Anneals Jet Parts

ALTHOUGH they lack many of the precision parts of reciprocating aircraft engines, turbo-jet engines nevertheless require many operations which must be performed to extremely close tolerances. For instance, fabrication of stainless steel aft-frames for these engines requires a carefully controlled annealing cycle to relieve stresses within the metal work. Solar Aircraft Co., San Diego, Calif., has installed two General Electric rectangular pit ribbon resistor electric furnaces for this operation.

Operating with a protective atmosphere, these furnaces are capable of annealing four frames at once, two per furnace. They are situated side by side and are so arranged that either can be charged by lifting the furnace lid with a hoist and depositing it on top of the adjacent furnace. Frames are placed in the furnace by means of a hoist.

An atmosphere gas converter supplies a protective atmosphere of carbon dioxide, nitrogen, carbon monoxide and a small quantity of hydrogen. The air-gas ratio is adjusted to produce a neutral mixture for purging the furnaces at the beginning and end of each cycle. Ribbon resistors, supported on the walls of the furnace casing, provide radiant heat to bring the equipment up to the proper temperature.

Frames are put in the furnaces and removed at a temperature below 500°

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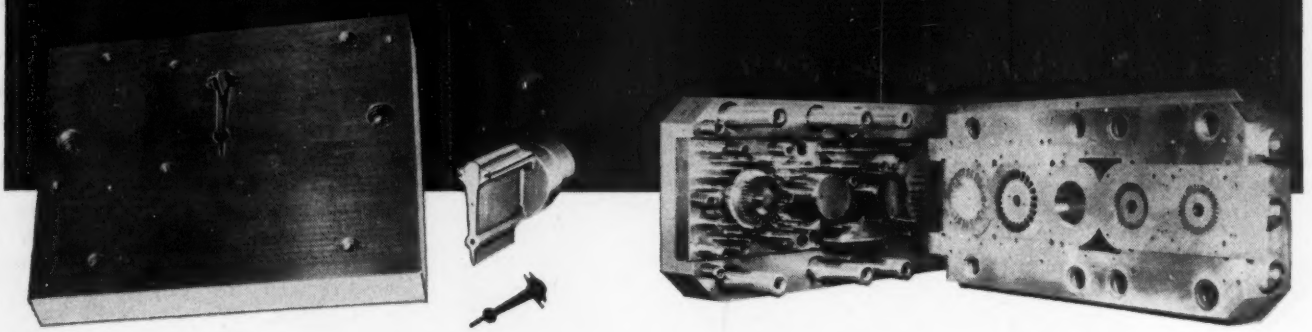
why be satisfied with "EXPECTED PRODUCTION" from *your* tools and dies?



Production Was "Satisfactory"
. . . But This Toolmaker Wanted MORE:

Output from this blanking die and punch seemed O.K. Yet the toolmaker, not content with only "passable" performance, re-examined the tool steel used. With the Carpenter Matched Set Method as a guide, he was able to put his finger on the one steel best suited for the job. Now, with No. 610 (Air-Wear), output has increased over 200%—and the die runs *4 times* longer between grinds. What a return—simply because he wasn't satisfied with "good enough"!

28% MORE Parts Between Grinds
. . . Because "Expected Production" Wasn't Good Enough:

Everyone agreed: This intricate die for blanking motor stator and rotor laminations from abrasive 2½% silicon steel was performing up to normal expectations. But that didn't stop them. Going just one step further, the toolroom foreman selected HAMPDEN (Oil-Wear) from the Carpenter Matched Set. Now the die is giving 28% more parts per grind—thus reducing downtime and regrinding expense. It really pays to go after *more* than "Expected Production"!

These jobs aren't the "one-in-a-million" variety. Results like these are being duplicated all over the country—because tooling men are no longer satisfied with "Expected Production" once they use the Carpenter Matched Set Method. And this Method is amazingly easy to put to work. One of its biggest advantages is the *simplification* it gives you—simplification of selection, heat treatment, and inventories. Prove it to yourself—it's easy. Simply pick out a job—put the Matched Set Method to work—then compare results!

Export Dept., Woolworth Bldg., New York 7, N.Y. "CARSTEELCO"

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BROSIUS

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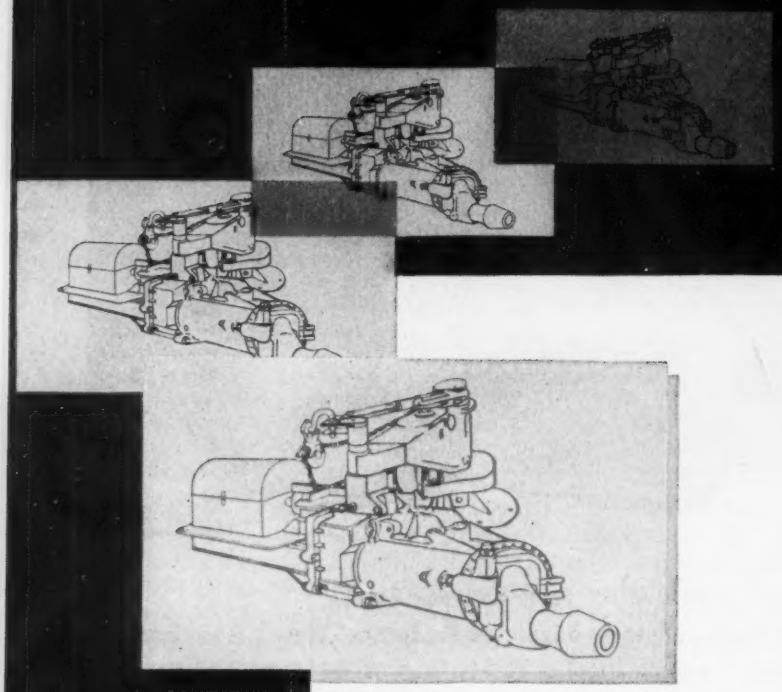

Here are two very good reasons why Brosius Clay Guns are so highly practical to operate and maintain. First, they are backed by many years of specific blast furnace engineering skill and experience; and second, each gun is individually designed, machined, assembled, inspected, and tested at the Brosius factory. For more information and literature on sturdy low-cost electric-mechanical, electric-hydraulic or steam guns, simply write to us.

Edgar E. BROSIUS Company Inc.
SHARPSBURG • PITTSBURGH 15, PA.

F; the material is completely stress relieved, without objectionable oxidation. Heat treating cycle consists of heating the material to 1650° F at the rate of 100° F per hour and holding the material at that heat for a period of 3 hours. Then the power input is shut off and the atmosphere gas cooler reduces the temperature at the rate of 200° F per hour to a temperature of 500° F. Heat treating cycle is controlled by a special program-type instrument controller which may be set to give a wide range of predetermined rates on increase and decrease in furnace temperature.

Shear Knife Handbook

USEFUL information for those who specify, use, buy, or grind metal-cutting shear knives is contained in a handbook of 48 pages, published by Heppenstall Co., Pittsburgh. Recommendations are given for selecting the correct grade knife for the cutting to be done and tips are presented to facilitate inquiries and order handling.

Space is devoted to current research and development of new knives and a grade listing of the company's shear knives. Several pages cover standard tolerances in knife manufacture, careful practices in grinding and the general care of shear knives. The illustrated handbook also has charts to calculate coil weight, tables for converting millimeters into inches, hardness conversion tables and decimal equivalents.

Gets Grease Where It Should Be

TO PARAPHRASE an old proverb, the way to a machine's heart is through a lubricant it uses.

To better enable grease to reach the vital parts of various types of machines, a portable electric grease gun, capable of producing nozzle pressure from 500 to 12,000 psi has been developed. Mounted on rubber tires and weighing about 230 pounds loaded, the 23-inch high and 27½-inch long machine allows 25 pounds of grease of any weight, from the heaviest fiberous to the lightest, to flow freely through a pressurized tank, even under low temperatures.

A development of Brown Grease Gun Co., Charlotte, N. C., the machine uses a modified Ford starter motor to develop up to 5 hp on a pump running through a series of gears running in oil. A thumbscrew adjusts the pressures.

A metering hand nozzle available on this gun can be adjusted to pass a tiny drop, or the largest shot of

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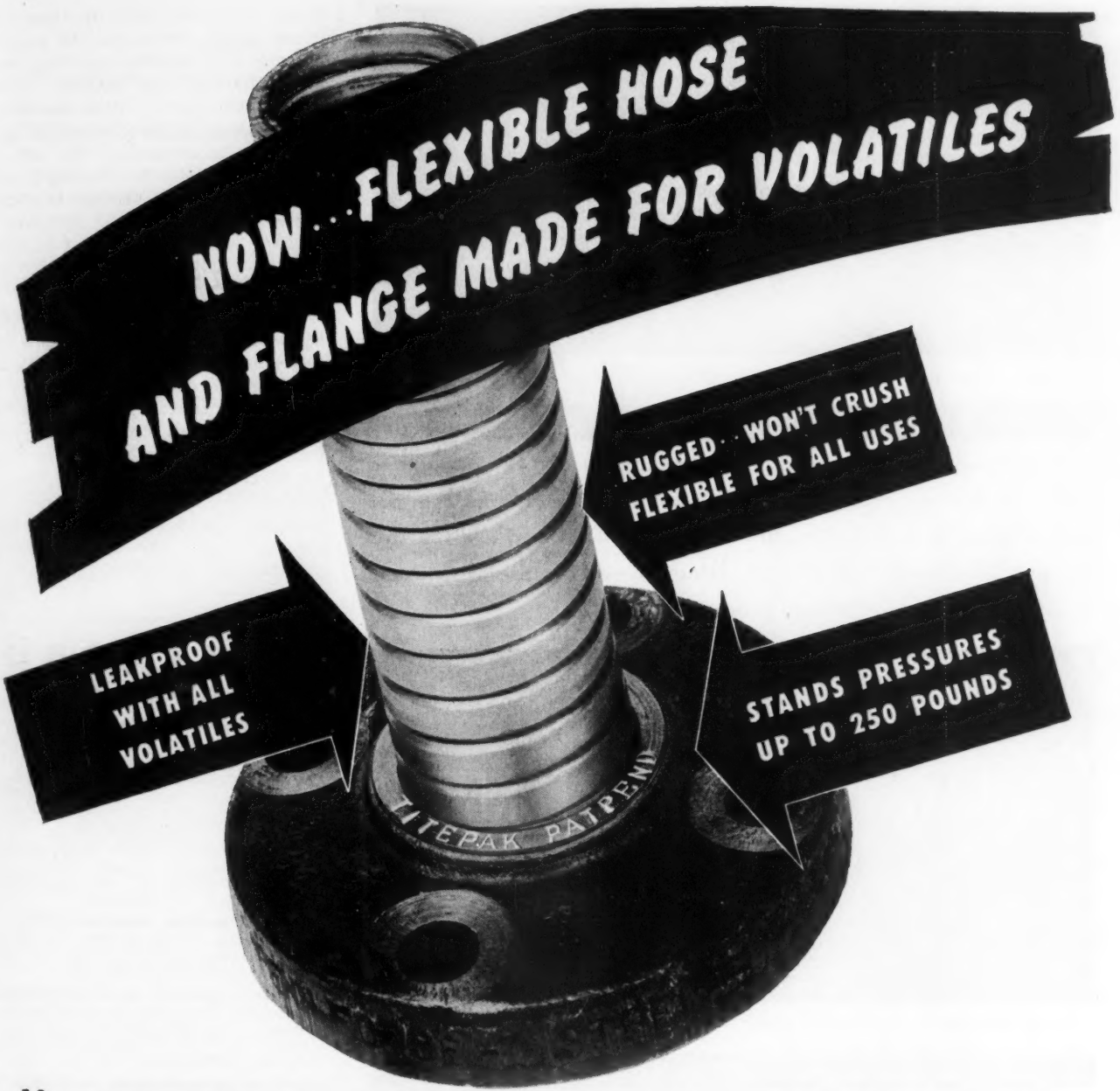

Here's the hose and flange that will handle highly volatile liquids . . . will not leak . . . yet is rugged . . . tough . . . and flexible.

Developed especially for the petroleum and chemical industries, this new Penflex hose has been tested and performance-proved. It will withstand pressures up to 250 pounds and has proved its value in conveying oil, gasoline, kerosene and other volatiles. Available in sizes 2½" to 12" I.D.

The new Penflex Titepak Flange completes this leakproof assembly. It is leakproof under all conditions . . . lighter in weight than other types of flanges . . . and is much lower in price. Penflex Titepak Flange assures greater efficiency in handling volatiles . . . lasts longer . . . is more rugged . . . and is tamperproof.

Penflex manufactures a complete line of four wall interlocked and seamless welded corrugated flexible tubing for the steel industry . . . automatic barrel fillers . . . pneumatic rivet passers . . . and accessories and fittings. To cut your maintenance, write for your copy of "Flexineering at Work."

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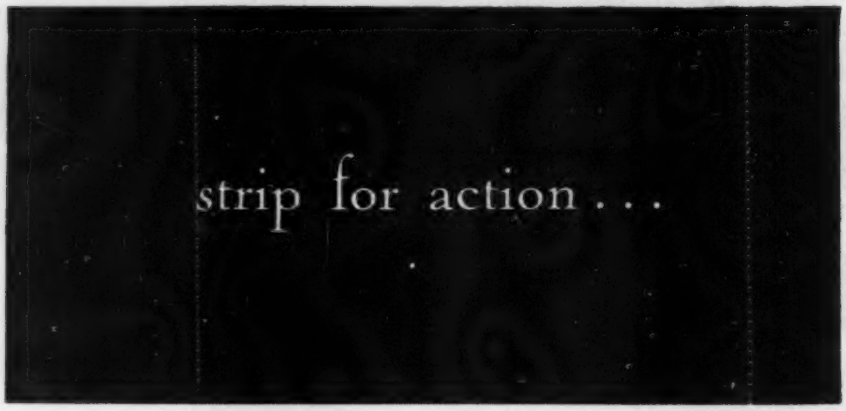
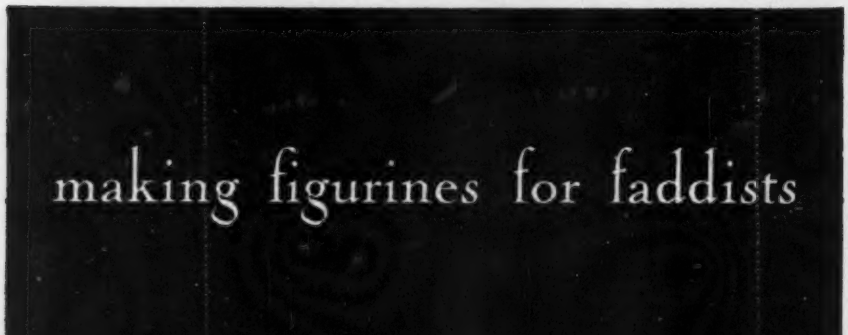
7219 Powers Lane **Philadelphia 42, Pa.**
Branch Sales Offices—BOSTON • NEW YORK • CLEVELAND • CHICAGO • HOUSTON • LOS ANGELES

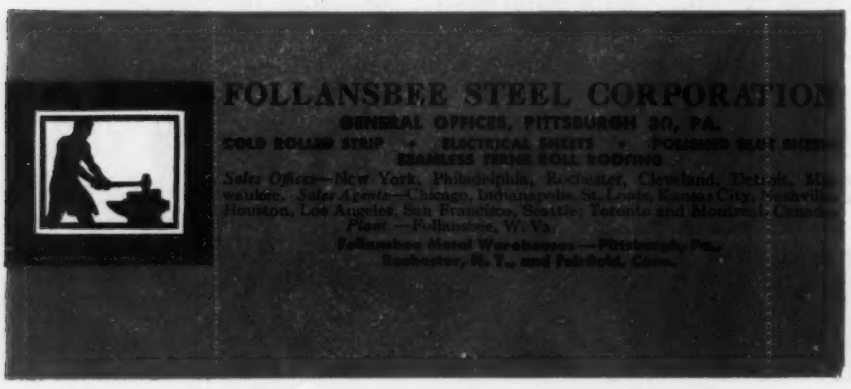
Penflex... HEART OF INDUSTRY'S LIFE LINES



FOLLANSBEE POLISHED BLUE STRIP will give you real action in the production-line because it's furnished in coils for feeding right into your automatic machines. For the utmost efficiency and economy in continuous operations try this superior Follansbee Polished Blue in coils—the distinctive color is a real asset in any product.



FOLLANSBEE POLISHED BLUE STRIP fits into many types of products, figurines or furnishings or fryers. The uniform-blue, high-gloss finish of Follansbee Polished Blue attracts discriminating buyers. In coils for automatic productioneering, and with mechanical and physical specifications to fit your needs, you'll find it worth while to tool for Follansbee Polished Blue and the other Follansbee Specialty Steels.



grease, then stop until the trigger is pulled again. Built into the nose of the gun is a rectifier and drop cord for recharging the battery. Tests have shown that it will grease about 5000 average fittings before the battery must be recharged. The built-in charger is capable of bringing a completely discharged battery to a full charge in 24 hours.

Produces Zinc Casting Alloys

WITH the establishment of a plant at Depue, Ill., New Jersey Zinc Co. is producing Horse Head Zamak alloys for the die casting industry in the middle west. These alloys are within the composition limits established by American Society for Testing Materials for commercial zinc die castings and are classified under the tentative specifications for zinc base alloys in ingot form for die casting specified by the society.

CALENDAR OF MEETINGS

† *Denotes first listing in this column*

June 19-23, American Society of Mechanical Engineers: Semiannual meeting, Hotel Statler, St. Louis. Society headquarters are at 29 W. 39th St., New York 18.

June 21-22, Caster & Floor Truck Manufacturers' Association: Summer meeting, Skytop Lodge, Skytop, Pa. Association offices: 7 W. Madison St., Chicago 2.

June 22-23, Malleable Founders' Society: Annual meeting, The Homestead, Hot Springs, Va. Society headquarters are in Union Commerce Bldg., Cleveland 14.

June 22-24, American Society of Mechanical Engineers: 16th national applied mechanics division conference, Purdue University, Lafayette, Ind. Society is located at 29 W. 39th St., New York 18.

June 26-30, American Society for Testing Materials: Annual meeting and exhibit, Chalfonte-Haddon Hall, Atlantic City, N. J. Headquarters of society: 1916 Race St., Philadelphia 3.

June 26-July 21, Product Design Seminar: Lehigh University, Bethlehem, Pa. Sponsored by Lehigh and Society of Industrial Designers, 48 E. 49th St., New York 17.

July 12-14, American Society of Civil Engineers: Summer convention, Toronto, Ont. Society headquarters are at 33 W. 39th St., New York.

July 12-14, American Home Laundry Manufacturers' Association: Meeting, Atlantic City, N. J.

July 28, Malleable Founders' Society: Western sectional meeting, Drake Hotel, Chicago. Society headquarters are in the Union Commerce Bldg., Cleveland.

Aug. 7-19, First U. S.-International Trade Fair: Coliseum, International Amphitheater and Navy Pier, Chicago. Fair headquarters are in Congress Hotel, Chicago.

Aug. 14-16, Society of Automotive Engineers: West coast meeting, Biltmore Hotel, Los Angeles. Society headquarters: 29 W. 39th St., New York 18.

Aug. 16-18, Third Western Packaging and Materials Handling Exposition: Civic Auditorium, San Francisco. Additional information from Clapp & Poliak Inc., 341 Madison Ave., New York 17.

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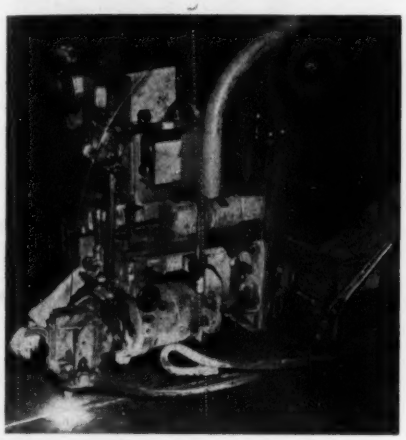
New Products and Equipment

Arc Welder For Aluminum

Using an arc maintained in a shield of argon gas between the consumable filler-metal electrode and the workpiece is a new machine for automatic welding of aluminum, announced by Linde Air Products Co., 30 E. 42nd St., New York 17, N. Y. The electrode, supplied as a coil of wire, is deposited across the arc into the weld as filler metal. The argon shielded metal arc welding process is applicable to either hand or machine welding and may be used for all of



the metals that are readily joined by Heliarc welding.

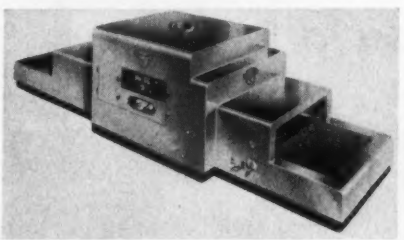
Welds are clean and smooth and use no flux. Possibility of flux corrosion or entrapment is eliminated. Aluminum alloys welded commercially by this process include 2S, 3S, 52-S, 61-S in plates ¼ to 1½ inches thick. Almost any thickness can be welded by a suitable number of passes with the FSM-1 machine. Butt welding is performed in the flat position and fillet and lap welding in the flat and horizontal positions.

Check No. 1 on Reply Card for more Details

Bakes Cores Evenly

Baking cores evenly throughout with an average baking cycle of only a few minutes and having a capacity of 4 tons of cores per hour is the M-7200 Ther-Monic electronic core baking tunnel, manufactured by Induction Heating Corp., 181 Wythe Ave., Brooklyn 11, N. Y. Cores up to 60 inches wide with a maximum combined height of core and core plate of 20 inches may be baked in the 8 x 8 x 25-foot unit. Conveyor speed is adjustable from 0 to 6 fpm.

After the baking cycle, the core plate may go directly to the inspection table, there being no cooling period involved. It is possible to adjust and control the green strength, hot strength, hardness, collapsibility and other characteristics of the cores. With resin binders, gassing is reduced to the point where blow holes in castings are no longer a problem. The electronic method achieves a finer fin-

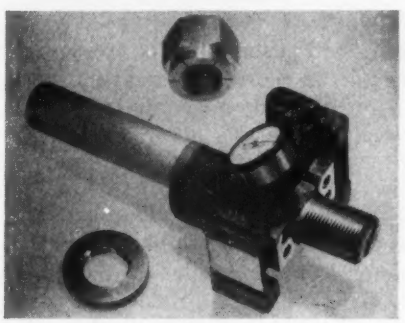


ish on the core surface and prevents over-baked cores and burned surfaces. Equipment automatically adjusts its power consumption in proportion to the amount of cores being baked.

Check No. 2 on Reply Card for more Details

Portable Internal Thread Gage

For inspection of internal threads in a range $\frac{5}{16}$ to 1 inch, either national coarse or national fine, Bryant Chucking Grinder Co., Springfield, Vt., has redesigned its portable internal thread gage. In principle it functions as a split plug gage. Plug



is collapsed by a thumb lever, inserted into the threaded hole and allowed to expand.

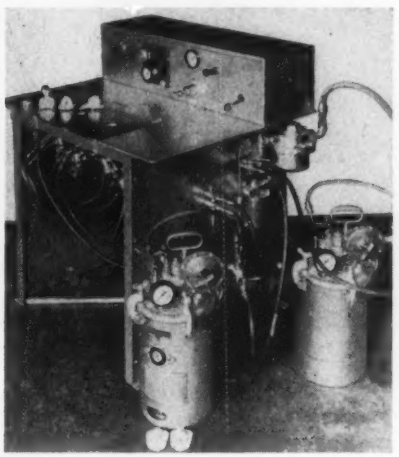
Apparent size of thread is shown on a dial indicator. Interchangeable segments can be obtained to cover a wide range of thread sizes. These segments fit the handle mechanism.

Check No. 3 on Reply Card for more Details

Spray Decorating Automatically

Many varied parts may be spray painted at speeds of 700 to 3600 pieces per hour with a machine for automatic spray decorating, built by Conforming Matrix Corp., Toledo, O. By use of different electroformed masks, which are readily interchangeable in the machine, and a resetting of the gun angles, the parts are spray painted. Machine is entirely air-operated. Masks for a particular part and color are inserted so as to be flush with the top of the machine's working table.

Spray painting is from below and against the masks, which, accordingly, do not have to be cleaned so often. Surplus spray falls away, is sucked off and exhausted out of the back of the machine. Operator holds the parts from above, exerting only the necessary manual pressure for proper



sealing of pieces against the masks. Two-color parts can be painted, one color after another, depending upon the nature of the job.

Check No. 4 on Reply Card for more Details

Fast Operating Magnetic Clutch

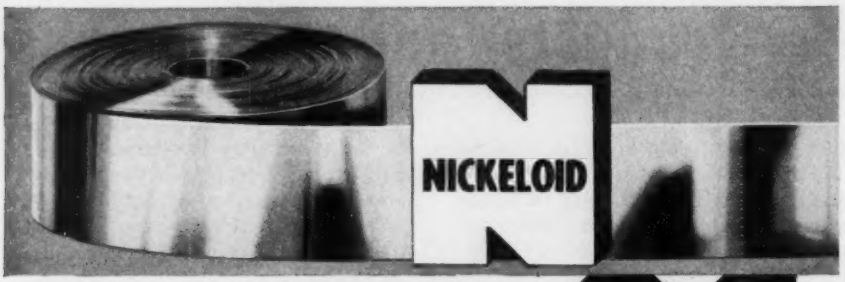
With a capacity of 0.20 hp and an input of 3 w, the compact magnetic clutch made by Barber-Colman Co., Rockford, Ill., is designed for servos and other devices, where rapid engagement and release is required. When the electromagnet is energized, the cork-faced driven disk is clamped between two driving motors.

For high torque transmission, driven disk is faced on both sides. Splined bore in driven disk permits easy coupling to load. Driving plates are ventilated for rapid cooling. Maximum torque is 4 pound-inches and maximum speed is 3600 rpm.

Check No. 5 on Reply Card for more Details

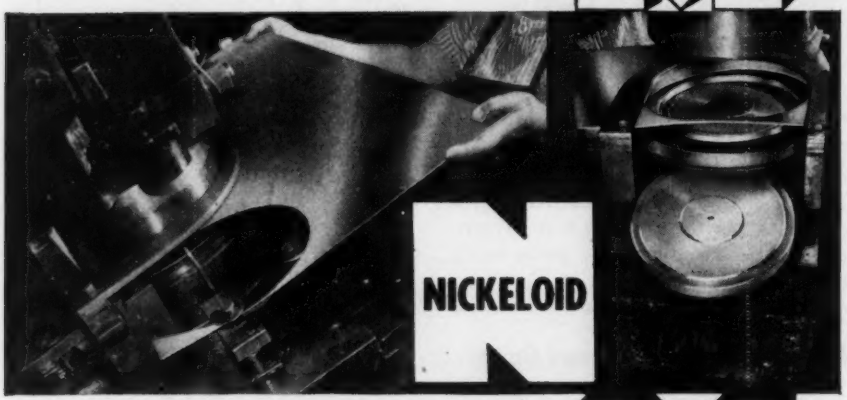
Fast Lift Fork Truck

Capable of lifting a 4000-pound load 130 inches in 26 seconds is a medium-weight electric power fork truck developed by Elwell-Parker Electric Co., Cleveland, O. Without load, the same height is reached in 15 seconds. Travel speed on straight-



LUSTROUS FINISHES, patterns, add beauty to any product.

It's More Than a **METAL**



JUST FABRICATE, then assemble, for lower production costs.

. . . It's Also a **METHOD**

In any re-design program, Nickeloid Pre-Finished Metals are something the Product Designer and Production Head can shake hands on. For Nickeloid Pre-Finished Metals not only offer the designer an inspiring, lustrous material — they also offer the production man a faster, lower-cost method — just *fabricate*, then *assemble!* What material could offer more?

Nickeloid Metals are available in sheets or coils, in a wide range of gauges and tempers, plated one or two sides, bright or satin finishes of Chromium, Nickel, Brass, or Copper, plated to base metals such as Steel, Zinc, Brass, Copper or Aluminum.

Write for new "Sampler" containing representative samples of Nickeloid *pre-plated* Metals.

NICKELOID METALS (Pre-Plated)

NICKEL · CHROMIUM · BRASS · COPPER
Electro-plated TO ALL COMMON *Base* METALS
ALSO LACQUERED COLORS
SHEETS AND COILS

OLDEST AND LARGEST PRODUCERS OF PRE-PLATED METALS

Established 1898

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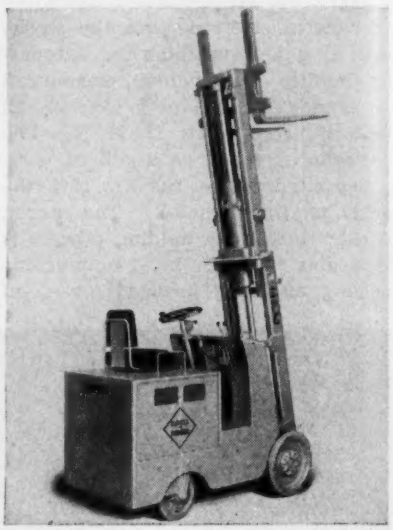
PERU 1, ILLINOIS

away with full load is 5½ mph. Friction is reduced between secondary hoist and primary upright column by six antifriction rollers serving as bearings. Truck's upright column is hydraulically tilted 5 degress forward from vertical in 2 seconds; 12 degrees backward from vertical in 4 seconds.



Overall length with 36-inch fork is 116 inches, width is 41 inches, height with uprights telescoped is 83 inches. Turning radius is 74 inches in intersecting aisles and 134 inches in right-angle aisles. A wide gage trailing axle provides extra stability for truck and load. Weight of truck is 7600 pounds.

Check No. 6 on Reply Card for more Details

Dynamic Strain Amplifier

Baldwin Locomotive Works, Philadelphia 42, Pa., is producing a portable strain amplifier designed for use with any standard cathode ray oscilloscope to measure almost any mechanical reaction detected by SR-4 bonded resistance wire strain gages. Identified as model BA-1, it may be used for load measurements, stress analysis and function analysis during operation of equipment to show amplitude, frequency and wave form of sharp transients, steady state oscillations, static loads or their combination.

Amplifier is a complete package of bridge elements, signal chopper, calibration system, amplifier and power supply. Data obtained may be recorded by special high speed cameras or an ordinary still camera without shutter. All frequencies between flat 5 to 20,000 cycles per second may be reproduced. Microinches in strain can be determined by using graphed curves in the cover of the instrument.

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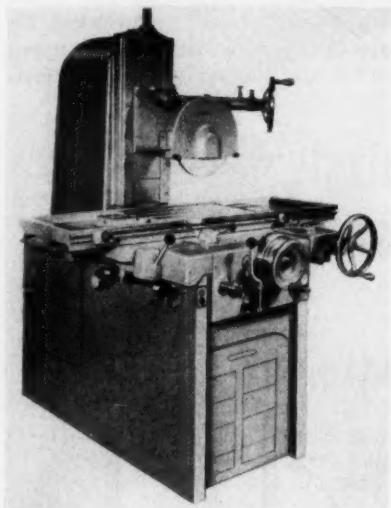
Noise level is minimized by use of battery power, shock mounting and proper selection of components.

Check No. 7 on Reply Card for more Details

Hydraulic Surface Grinder

Featuring a wide cross travel of 12 inches and a table length of 18 inches the No. 1218 Hydrabrasive surface grinder, announced by Abrasive Machine Tool Co., East Providence 14, R. I., has power furnished by a fan-cooled, totally enclosed 3



hp spindle motor driving a 12-inch wheel. Machine has a slow speed range for crush grinding on one extreme and fast conventional grinding on the other.

Table speeds are almost instantly adjustable from ½ to 90 fpm, with ⅜-inch cross feed movement in 2/10-second. For precision transverse adjustment, machine has saddle ballways. It may be equipped with special fixtures for high production grinding.

Check No. 8 on Reply Card for more Details

High Speed Drill Head

Speed range of 2500 to 7500 rpm and a chuck capacity of 0 to 5/32-inch are incorporated in the automatic drill head announced by Dumore Co., Racine, Wis. In cold rolled SAE 1020 steel, it will accommodate No. 80 (0.0135-inch) to No. 30 (0.1285-inch) drills. In materials such as copper, aluminum, and zinc, No. 80 (0.135-inch) to No. 15 (0.180-inch) drills may be accommodated.

Stroke adjustment is by an adjustable stop nut. Minimum and maximum strokes are 3/16 to 1⅛ inches, respectively. Motor operates on 115 v, 50-60 cycles ac. Compressor is of the 3-vane rotary type. Overall length of the drill head is

The ABC of MST

ALWAYS MAKES POSSIBLE BETTER PRODUCTS AT LOWER COST

Michigan
The Modern Electric Resistance
WELDED
STEEL TUBING

ECONOMICAL • LIGHT WEIGHT • MACHINE ABILITY • HIGH UNIFORM STRENGTH

ROUND
¼" to 4" O. D. 9 to 22 gauge
SQUARE-RECTANGULAR
½" to 2" 20 gauge 1" to 2¾", 14, 16, 18 gauge

Can be Bent,
FLANGED, EXPANDED, TAPERED, DEPRESS BEADED, EXPAND BEADED, ROLLED, EXTERNAL UPSET, INTERNAL UPSET, SPUN CLOSED, FORGED, BEVEL FLANGED, FLATTENED, SWAGED, FLUTED.

Consult us for engineering and technical help in the selection of tubing best suited to your needs.

At MICHIGAN we've never admitted there are such words as, "It can't be done!" That's why we've convinced thousands of manufacturers that MICHIGAN TUBING is an ideal, cost-saving product component. No matter what you manufacture, let us prove that the use of MICHIGAN TUBING can give you a better product and save you money.

A Quality Product, can be worked in your plant or prefabricated by MICHIGAN.

RESISTANCE WELDED STEEL TUBING
Michigan STEEL TUBE PRODUCTS CO.
THE OLDEST NAME IN ELECTRIC

33 Years in the Business
9450 BUFFALO STREET • DETROIT 12, MICHIGAN
FACTORIES: DETROIT, MICHIGAN • SHELBY, OHIO

DISTRIBUTORS: Steel Sales Corp., Detroit, Chicago, St. Louis, Milwaukee, Indianapolis and Minneapolis—Miller Steel Co., Inc., Hillside, N. J.—C. L. Hyland, Dayton, Ohio—Dirks & Company, Portland, Oregon—James J. Shannon, Milton, Mass.—Service Steel Co., Los Angeles, Calif.—American Tubular & Steel Products Co., Pittsburgh, Pa.—Strong, Carlisle & Hammond Co., Cleveland, Ohio.

SHORTER

THERE ARE ONLY THIRTY INCHES from the heel of fork to the back of this Ride-A-Type Truck, yet plenty of foot room on the platform. Platform is rounded for shorter turning radius.

EASIEST CONTROL

EASY GRIP ROLLER TYPE HANDLE for two speeds forward and two speeds reverse. Push button in the end of handle operates lifting mechanism. Valve is mounted on pump and oil tank for cushion or speedy lowering.

Most Experience and Creative Ability in the

POWER

18-VOLT MOTOR DRIVE UNIT provides plenty of power to handle the required capacity and added speed of this type of truck.

FOOT TREADLE SAFETY SWITCH. When weight is applied the power is on and the brake is off. When foot is removed the power is off and the brake is applied. Foot guard and body guard are furnished on platform for operator's protection.

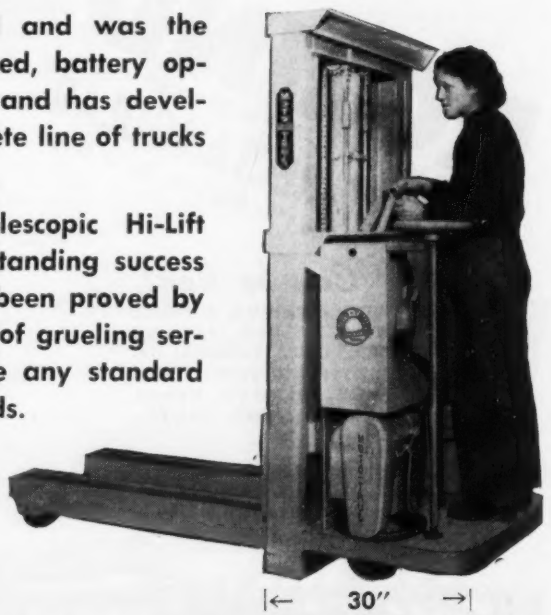
SAFETY

MOTO-TRUC *Motorized* **BATTERY OPERATED WALKIE TRUCKS.**

18-Volt Ride-A-Type Truck

Moto-Truc originated and was the first to build motorized, battery operated walkie trucks and has developed the most complete line of trucks of this type.

The Ride-A-Type Telescopic Hi-Lift Truck is another outstanding success of Moto-Truc. It has been proved by more than two years of grueling service. Made to handle any standard type of pallet and skids.



BULLETIN NO. 50 shows the extensive Moto-Truc line. Write for it today.

PALLET, PLATFORM, HI-LIFT, AND CRANE TRUCKS

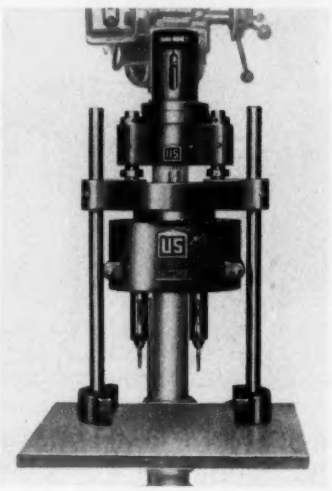
The MOTO-TRUC Co.
1953 E. 59th Street
CLEVELAND 3, OHIO.
ORIGINATORS OF MOTORIZED HAND TRUCKS

14¼ inches. A return spring automatically withdraws the drill at the end of the stroke or for chip clearance when the drill slows down below 1000 rpm.

Check No. 9 on Reply Card for more Details

Tapping Unit Also Drills

United States Drill Head Co., 616 Burns St., Cincinnati 4, O., is producing a tapping unit for mounting on a machine not having a reversing spindle. Setup shown is on a 17-inch Delta floor type machine. When this type of head is furnished for tapping, the spindles may be equipped with single purpose tap chucks, floating or safety tap holders which prevent tap breakage and permit hole to be tapped to the bottom without any breakage.



By locking the tapping unit, the complete setup may also be used for drilling. Compactly designed, it requires a minimum amount of space between the end of the drill press spindle and the table. Drive is through a positive tooth clutch of alloy steel and gears are of the same heat treated material. It is so geared as to reverse the taps three times as fast as the tap feeds. Attachment is adaptable to any drilling machine, round quill or flange type spindle.

Check No. 10 on Reply Card for more Details

Makes Welder Air Operated

Advantages of air pressure operation may be added to foot-controlled rocker arm type spot welders by a self-contained unit, the Weld-Air-Matic, made by Robert W. Hoffman Co. Inc., 32 S. Clinton St., Chicago 6, Ill. Unit clamps to the upper horn of the conventional rocker arm spot welders, operating on a reduced air pressure of 15 to 50 pounds, depend-

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Your basic rights

in buying plating and polishing equipment and supplies

Single Responsibility

... by concentrating your orders with a single source of supply, you eliminate many hours of costly paper work. You pay one bill ... have only one supplier who is responsible for your satisfaction ... you get your order when and how you want it ... eliminate days and maybe weeks of waiting. Whether you want an automatic conveyor or a pair of rubber gloves, H-VW-M can shoulder the whole responsibility for the entire order.

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... H-VW-M technical assistance is provided by a highly trained staff of chemical, electrical and mechanical engineers backed by the finest laboratory facilities in the industry. H-VW-M Service does not end with delivery of your order ... it is always on tap anytime and anywhere. H-VW-M products are strategically warehoused for prompt delivery ... and because inventories are large all orders get immediate attention.

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... you have a right to expect to get exactly what you pay for ... to receive equipment and supplies that accurately measure up to specifications and represent full value of your investment. H-VW-M equipment and supplies are priced to meet changing market conditions ... and H-VW-M *always* delivers full value. What's equally important, is the fact that because H-VW-M serves as the central source of supply for ALL the needs of the electroplating and polishing industry, you can always be sure that price levels will be equably maintained.

Uniform Quality

... means that you get full value for your investment. It means that you are doing a better job ... are helping your company operate at higher profit levels. The reputation for uniformly high quality H-VW-M has earned is one that has been built up honestly over many years. It is your right to expect it. Through strict control of every manufacturing process H-VW-M works ceaselessly to see that you get uniform quality.

HANSON-VAN WINKLE-MUNNING COMPANY, Matawan, N. J.

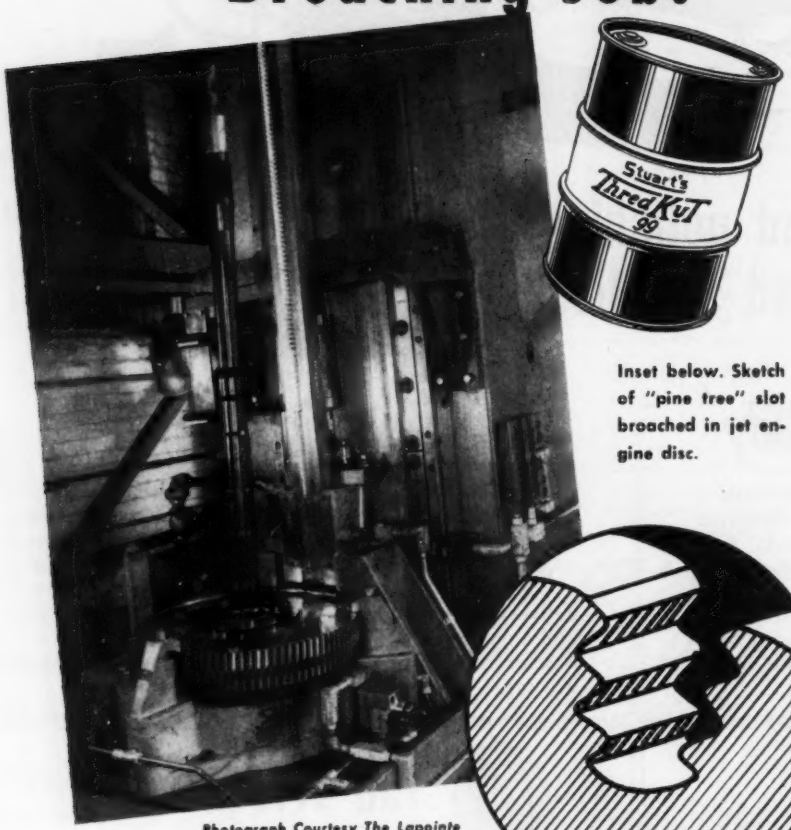
Plants at: Matawan, N. J. • Anderson, Indiana • *Sales Offices:* Anderson Chicago • Cleveland • Dayton • Detroit • Grand Rapids • Matawan Milwaukee • New Haven • New York • Philadelphia • Pittsburgh Rochester • Springfield (Mass.) • Stratford (Conn.) • Utica

SINCE 1820

H-VW-M

Manufacturers of a complete line of electroplating and polishing equipment and supplies

"ThredKuT 99 smooths out tough "PINE TREE" Broaching Job!



Inset below. Sketch of "pine tree" slot broached in jet engine disc.

Photograph Courtesy The Lapointe Machine Tool Company

HERE is one of the most difficult broaching jobs that the metalworking industry has ever tackled and solved — cutting the "pine tree" shaped slot in exceptionally tough alloy steel jet engine discs.

Stuart's THREDKUT 99 has rendered outstanding service for leading manufacturers in this field. Its combination of high anti-weld and high lubricity characteristics proved to be a 100% satisfactory solution to difficulties of this job.

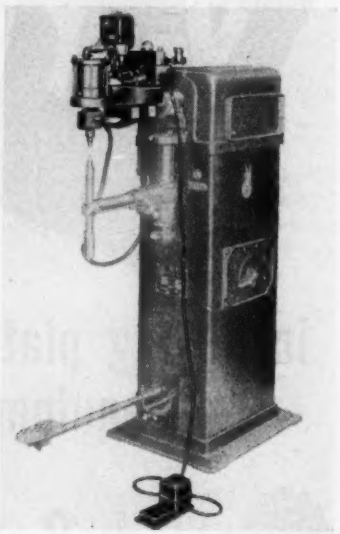
What is your broaching job? The toughest ones can be handled better, and the easy ones are easier with the right Stuart products! Ask for Stuart's pamphlet OILS FOR BROACHING or call your nearby Stuart representative.

D.A. Stuart Oil CO.

2735-37 So. Troy St., Chicago 23, Illinois

ing on particular requirements of the welder.

Eliminating necessity of all rocker arm movement, the attachment operates through a maximum stroke of 1½ inches on size 1 welder, 2 inches on size 2 and 2½ inches on size 3. A light touch on an electric foot

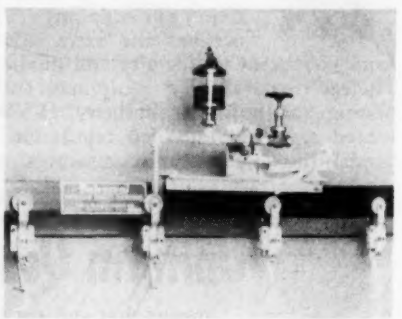


switch controls the air pressure, energizing a coil on a four-way operating valve. Unit is designed to operate in conjunction with any standard weld timer control. It is available in three standard sizes.

Check No. 11 on Reply Card for more Details

Lubricates All Trolley Wheels

Constant and entirely automatic is the Oilaire automatic lubricator for conveyor trolley wheel bearings, made by E. W. Buschman Co., Cincinnati 32, O. Eliminating time, expense and uncertainty of lubricating



these wheels by hand, the device automatically sprays a film of oil on every wheel bearing. It may be operated continously or limited to a single conveyor cycle once a week.

The oil mist is injected into the inner faces of the wheels through a vertical pipe located in the center of the rail where it is held rigid and free from external misalignment. As each pair of trolley wheels passes the

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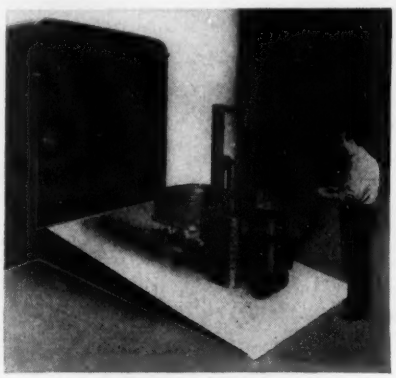
lubricator they trip lever arms which automatically release jets of oiled air directly into the bearing. Installation is by bolting the device to the track and connecting to air supply lines.

Check No. 12 on Reply Card for more Details

Loading Platform Adjustable

Loading platforms or docks may be made the same height as the truck by the Make-It-Evener adjustable loading platform manufactured by Revolvator Co., North Bergen, N. J. Built into the loading platform, it is usually about 8 feet long and 6 feet



wide. Inside end is held in position by a pivot, while the outer end is raised or lowered by hydraulic ram operated by electric-oil, air-oil, water or by hand. Capacity can be made to suit requirements up to 20,000 pounds.

Equipment may also be used to raise or lower the rear wheels of highway trailers and trucks to make them even with a platform.

Check No. 13 on Reply Card for more Details

Separates Coolant Magnetically

Ferrous particles such as chips, cuttings, etc., down to extremely fine sizes may be removed from cutting and lubricating oils by a magnetic coolant separator developed by Magnetic Engineering & Mfg. Co., Clifton, N. J. Use may also be for separating fine or granulated particles from a liquid or separating magnetic material from nonmagnetic material. Sizes range from 18 inches OD having an approximate capacity of 40-60 gallons per minute of feed, to 60 inches OD with an approximate capacity of 250-300 gallons per minute.

For most applications permanent magnets requiring no electric current can be used, but for more difficult jobs electromagnets are recommended. Material to be separated is fed into the pipe at the bottom of the machine and flows up uniformly in-

TRAILER HITCH MAKES 4-WAY SWITCH..

NOW THE COMPLETE ASSEMBLY *uses* UNITCASTINGS!

Several months ago this hitch manufacturer switched one part of his assembly to Unitcastings after weldments proved unsatisfactory. Now he's changed over the entire unit. Unitcastings gave him lower end costs, pleasing eye appeal, greater strength with less weight, increased safety and no misfits. Sales have gone up several hundred percent—proving that Unitcastings not only give top performance but add to the saleability of your product. Build better and save with Unitcastings.

UNITCAST Corporation
QUALITY STEEL CASTINGS

Give us a chance to offer a "cast steel" answer for your parts problem. Our suggestions while your product is in the design stage will pay continuous dividends. Write or call today. Unitcast Corporation, Steel Casting Division, Toledo 9, Ohio. *In Canada:* Canadian-Unitcast Steel, Ltd., Sherbrooke, Quebec.

UNITCASTINGS ARE FOUNDRY ENGINEERED

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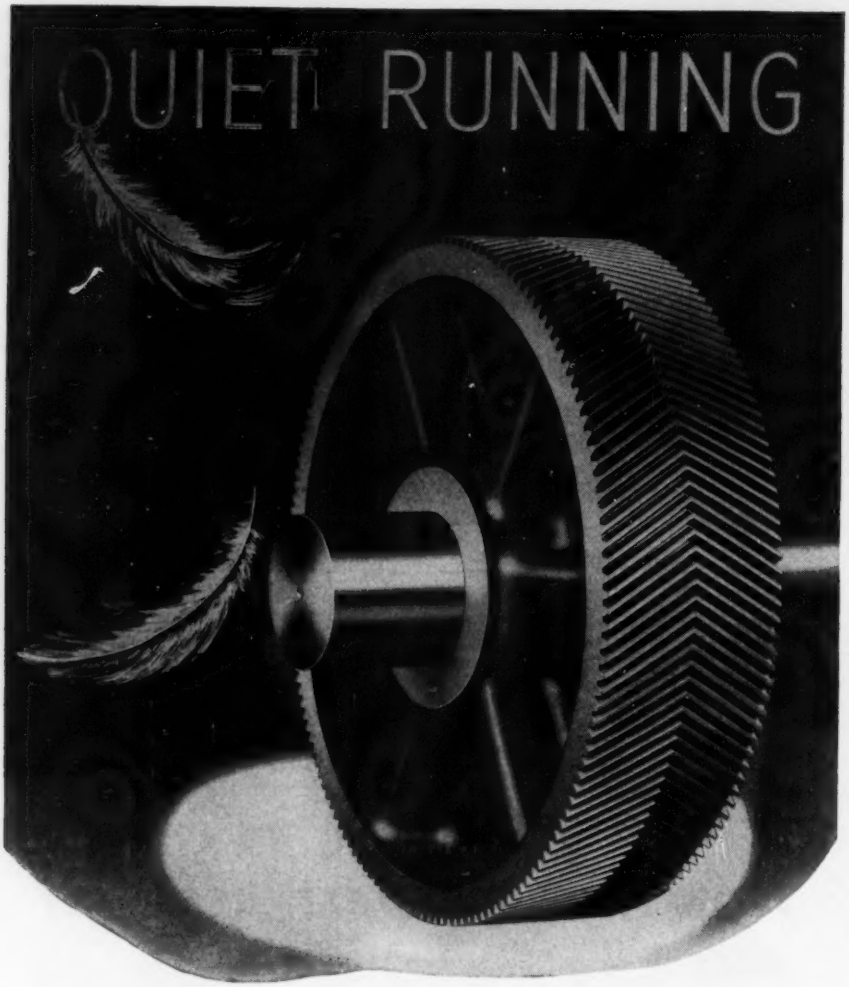


HERRINGBONE GEARS
by Horsburgh & Scott

● Here's why Horsburgh & Scott Herringbone gears are quiet and smooth running at all speeds . . . 1. Sykes type where two or more teeth are always in contact. 2. Teeth accurately generated on finest gear cutting machines with correct amount of backlash. 3. End thrust entirely eliminated. 4. Pitch line absolutely concentric with bore. 5. Rims, arms and hub extra heavy for pitch of gear. It will pay you to try these superb gears.

Send note on Company Letterhead for 488-Page Catalog 41

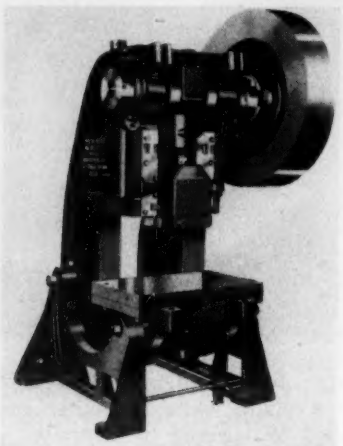
THE HORSBURGH & SCOTT CO.
GEARS AND SPEED REDUCERS
5112 HAMILTON AVENUE • CLEVELAND 14, OHIO, U. S. A.

side the unit. The magnets arranged around the circumference attract the magnetic particles and the nonmagnetic material flows out near the top through a center opening and out of another pipe at the bottom of the machine. Machine may be furnished with or without motor drive.

Check No. 14 on Reply Card for more Details

85-Ton Open-Back Press

One-piece special alloy frame with built-in tie rods to insure rigidity and strength is a feature of the 85-ton open back inclinable Press-Rite power press, offered by Sales Service Machine Tool Co., 2363 University Ave., St. Paul 4, Minn. Design of tie



rod frame reduces binding or misaligning of dies on extra heavy drawing and blanking operations. Other features include nonrepeat single stroke mechanism, automatic cam-actuated brake, antifriction roller bearings in the flywheel and four-point engagement sliding key clutch on the flywheel drive or air friction clutch and brake on the back geared press.

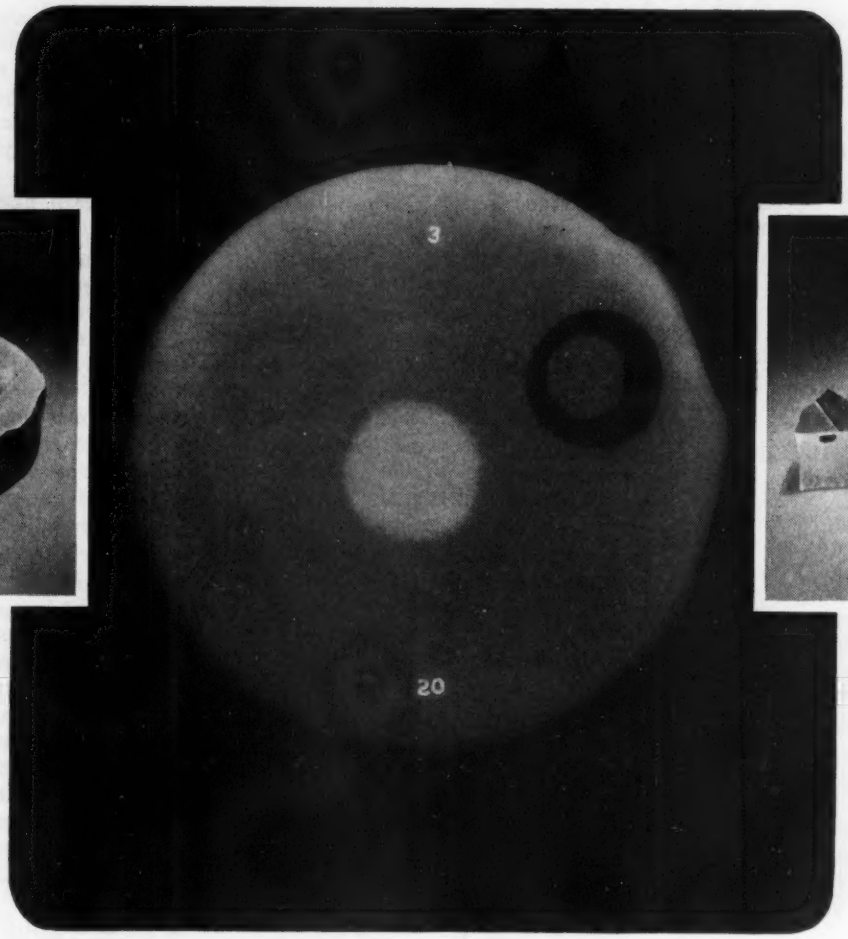
Bolster area is 22 x 36 inches and throat depth is 12 inches. The shut heights and strokes are optional. Press may be furnished with either flywheel drive or back geared standard sliding key clutch. It has built-in air friction clutch and brake on back gear presses only.

Check No. 15 on Reply Card for more Details

For Faster Grinding

Faster and more accurate grinding of chip-breaker grooves in round, square, triangular and rectangular shapes and for rough and finish grinding of dull or damaged solid carbide insert tools is possible with the carbide insert grinding fixture, made by Hammond Machinery Builders Inc., 1627 Douglas Ave., Kalamazoo 54F, Mich. It is offered in two

Aluminum alloy casting 2¼ x 11¼" for aircraft accessory part.



Radiograph which revealed defect in casting.

Section reveals hole detected by radiography.

Minutes of Radiography saved hours of machining

AFTER machining, this aluminum alloy casting was to be an important part in an aircraft accessory, vital to high-altitude flying. The finished part was needed quickly by the customer. Design specifications demanded high quality.

This was no time to wait for machining to disclose any defects. There was too much to lose —setup time, machining time, take-down time, as well as the reputation of the foundry.

Radiography saved all that. In a few minutes it revealed a defect that caused rejection of the rough casting at the foundry. Other castings, proved sound by radiography, were sent to the customer.

Cases like this show how more and more foundries are able to release only sound castings. Perhaps even more important, radiography is showing how to make consistently sound castings, by picturing the internal effects of changes in gating, venting, chilling, pouring temperature, and other variables.

Ask your x-ray dealer to explain how radiography can help you increase yield and cut costs.

EASTMAN KODAK COMPANY
X-Ray Division, Rochester 4, New York

Radiography . . .

another important function of photography

Kodak
TRADE-MARK

styles: Model VC style M with motor, switch, motor cord, lug base and one round collet and model VC style H with lug base and one round collet.

Motorized model may be mounted on most tool and surface grinders, the motor being employed for sharpening all shapes and for grinding chip breakers in round inserts. Motor is shut off for grinding square, triangular and rectangular shapes. Collet spindle can be swiveled on horizontal axis 90 degrees from vertical to right and 45 degrees to left and 360 degrees on vertical axis.

Check No. 16 on Reply Card for more Details

Lathe Turnstile Bed Turret

An accessory for 16-inch swing South Bend precision lathes in use is a hand-feed turnstile bed turret, introduced by South Bend Lathe Works, South Bend 22, Ind. Installation makes possible economical production of duplicate precision parts, but does not change the basic lathe in any way. Turret can be removed at any time and tailstock remounted for regular lathe work. All feeds are hand operated through the balanced turnstile. It may be locked in position at any point along the usable length of the lathe bed.

Effective feed of turret slide is 6⅛-inches; distance from center of turret tool holes to top of slide 2½ inches. Head is to be bored by user to take six standard turret tools with 1½-inch diameter shanks.

Check No. 17 on Reply Card for more Details

• • •

WOVEN WIRE SLINGS: Cambridge Wire Cloth Co., Cambridge, Md., announces that its woven wire slings are now available in standard widths of 3 to 30 feet and from 36 to 132 feet, standard lengths. They are used for handling of heat exchanger tube bundles, rod and bar stock and pipe and cylindrical tanks.

Check No. 18 on Reply Card for more Details

SHIELDED WELDERS' CLAMPS: Identified as style No. 120-S, a new line of Jorgensen shielded welders' clamps is announced by Adjustable Clamp Co., Chicago 22, Ill. It features a steel shield over the full length of the clamp screw to protect it from spatter and other damage. Clamp is available in all sizes from 2 to 12-inch opening capacities.

Check No. 19 on Reply Card for more Details

DUSTPROOF COUNTER: A totally enclosed electric counter, protected against moisture, dust and other atmospheric conditions, is offered by Production Instrument Co., Chicago 6, Ill. Unit consists of a Wizard electric counter built into a gasket sealed cast aluminum case with cement sealed plastic window. It is available with four or six number wheel, key reset, knob reset or non-reset and for any voltage up to 220, ac or dc.

Check No. 20 on Reply Card for more Details

SERIES BALLAST: Designed for use with two 48T12 lamps, a new ballast for series operation of slimline and 40-w instant start fluorescent lamps is announced by General Electric Co.'s Specialty Transformer and Ballast Divisions, Schenectady, N. Y.

Check No. 21 on Reply Card for more Details

UNIVERSAL CHUCK: For use on lathes, indexing heads and circular tables of milling machines and similar machine tools, the Zus universal chuck is offered by Cosa Corp., New York 17, N. Y. It clamps concentric and is eccentrically adjustable. It is available in two sizes.

Check No. 22 on Reply Card for more Details

TANK FOR ANODIZING: A tank for anodizing aluminum has been developed by F. H. Langsenkamp Co., Indianapolis, Ind. Available in all sizes in stainless steel, aluminum or copper, it is reinforced within itself thereby keeping buckling to a minimum, preventing galvanic action and lengthening tank life.

Check No. 23 on Reply Card for more Details

CORROSION-RESISTANT COATING: Carboline Co., St. Louis 5, Mo., announces Polyclad, a corrosion resisting protective coating for use on metal, concrete and wood. It is flexible, nontoxic, nonflammable and thermoplastic. When properly applied, the coating is waterproof, unaffected by weather and inert to most corrosive atmospheres, dilute acid and alkali solutions, gasoline, oil and food products.

Check No. 24 on Reply Card for more Details

PLASTIC FACE MASK: No. 305 and No. 306 foundry goggles, available from American Optical Co., Southbridge, Mass., will be supplied with a plastic face mask instead of the leather mask formerly used. New mask can be sterilized by spraying, wiping or dipping and will retain its shape and properties.

Check No. 25 on Reply Card for more Details

STEAM JETS: Series FM-1A Karbate brand impervious graphite circulating steam jet is introduced by National Carbon Division, Union Carbide & Carbon Corp., New York 17, N. Y. They are adapted to heating of liquids in tanks where agitation and good circulation are requisites and where dilution of solution is not harmful. They withstand action of practically all corrosive liquids, including sulphuric acid, hydrochloric acid and nitric-hydrofluoric acid mixtures.

Check No. 26 on Reply Card for more Details

MEASURES WALL THICKNESS: No. 577 micrometer, made by L. S. Starrett Co., Athol, Mass., has a rounded anvil which makes it possible to measure in thousandths of an inch the wall thickness of tubing, half bearings and full bearings and various cylinders with walls up to 1-inch thick and diameters all the way down to ⅜-inch ID.

Check No. 27 on Reply Card for more Details

HARDFACING ALLOY: Designed primarily for applications involving high stress abrasion with medium impact, Aircolite 59, a new hardfacing alloy is offered by Air Reduction Sales Co., New York, N. Y. Cast in rod form, it is composed principally of chromium, molybdenum, carbon and iron. The deposit maintains its high hardness at temperatures up to 800° F.

Check No. 28 on Reply Card for more Details

SPLASH-PROOF MOTORS: Type CSP Life-Line splash-proof induction motors are available from Westinghouse Electric Corp., Pittsburgh 30, Pa. These squirrel cage motors are designed for constant speed application both indoors and outdoors and are equipped with prelubricated bearings, requiring no lubrication for life of bearing.

Check No. 29 on Reply Card for more Details

TWO-PASS BROACH: Kase Machine Co., Cleveland 19, O., introduces a new series DK Glenny broach which facilitates the cutting of exceptionally long or deep keyways. Available in a complete range of sizes for special or production keyway cutting, it incorporates two slots in the broach body and only one cutting blade. Blade is cut on a taper to assure positive cutting action by each tooth.

Check No. 30 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

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Market Summary

STEELMAKERS are still falling behind on deliveries. Despite record-breaking production the last nine weeks they are making virtually no progress catching up on order accumulations. In fact, overall supply is tighter today than two months ago. The mills will enter third quarter with heavy tonnage backlogs in most major products, especially sheet and strip. Bar, plate, shape and specialty backlogs also will be heavy with deliveries extending into fourth quarter. Bulk of third quarter output already is committed, leaving only relatively small tonnage open in the period for new business.

OUTLOOK—All signs point to heavy consumer requirements throughout the rest of the year. Some slackening, however, would not be surprising. Vacation shutdowns alone may ease demand pressure. Still, high level business throughout summer months is indicated with steelmaking facilities pushed to the limit as producers endeavor to reduce accumulations. Normal seasonal decline in demand for tin plate, building steel, requirements for certain household appliances and even automobiles also may contribute to an easing in pressure as summer advances.

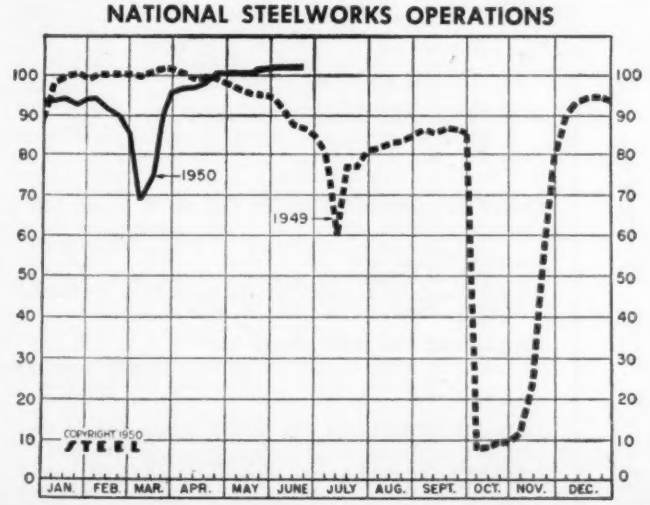
PRODUCTION—Steelmaking operations stay close to the postwar high, estimated national ingot rate last week holding at 101.5 per cent of capacity for the fourth consecutive week. During May the industry produced 8,549,038 net tons, largest monthly output in history. Indications are June production will come close to that mark. Despite the heavy current output, cumulative production in the first five months this year, 38,972,363 tons, fell 516,000 tons under that in the like period of 1949.

PRICES—Upward pressure on finished steel prices is intensifying. But no general advance appears in prospect. All major producers indicate continued resistance to rising raw material costs though they express concern over the outlook. Signs of a reaction in the runaway scrap market have tended to ease pressure for a general markup on finished steel. Additional small producers, however, have joined the list of those increasing sheets and strip. Also, consumers in growing number are turning to the high-priced conversion and premium markets for relief.

CHANGES—Last week Superior Steel Corp. raised hot-rolled carbon strip $5 per ton as did the Stanley Works. Detroit Steel Corp., the Stanley Works, Newman-Crosby Steel, and Wallingford Steel increased cold-rolled strip $7. Other price changes in the week included automatic increases on galvanized sheets when zinc rose to 15 cents per lb, and an increase in galvanizing extra on nails by the Dickson Weatherproof Nail Co. One producer of galvanized pipe increased prices $8 per ton and another smaller maker is considering similar action. Alloy and stainless steel producers are severely hit by rising raw material costs and price advances may be in the making in this area. Timken Roller Bearing Co. says its costs, especially scrap and nickel, on one important grade of alloy steel are up $18.20 per ton in the last three months. Stainless makers' scrap costs are up at least $50 per ton compared with a few months ago, some of them paying as much as $150 per ton for material.

COMPOSITES—Upward spiral in scrap came to an abrupt end last week, STEEL's composite on steelmaking grades dropping $1.50 to $39.33. This was the first decline since end of February when the rise started from $27.33. Due to scattered upward revisions, the weighted index on finished steel rose to 156.58 from a revised figure of 156.25 the preceding week. Since latest price changes remain within previously quoted ranges on various products the arithmetical composite on finished steel holds steady at $94.32. Pig iron composites also are unchanged with No. 2 foundry, $46.47, basic, $45.97 and malleable, $47.27.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended June 17	Change	Same Week 1949	Same Week 1948
Pittsburgh	101.5	0	82.5	94
Chicago	103.5	+ 0.5*	96.5	95.5
Eastern Pa.	98	0	83	90.5
Youngstown	106	0	89	103
Wheeling	106.5	0	69	94.5
Cleveland	103	+ 3.5	91.5	95.5
Buffalo	104	0	91	99
Birmingham	100	0	100	100
New England	85	— 1	58	78
Cincinnati	104	— 2	97	98
St. Louis	91	0	66.5	89.5
Detroit	109	+ 5	101	100
Western	101	0	83	..
Estimated national rate	101.5	0	86.5	96

Based on weekly steelmaking capacity of 1,906,267 net tons for 1950; 1,843,516 net tons for 1949; 1,802,476 net tons for 1948.
*Change from revised rate.

News Summary—p. 53 *Production-Engineering News—p. 83*

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Composite Market Averages

	June 15 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100)	156.58	156.25*	156.13	152.90	101.78
Index in cents per lb.	4.242	4.233*	4.230	4.142	2.757
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$94.32	$94.32	$93.23	$91.82	$58.27
No. 2 Fdry. Pig Iron, GT	46.47	46.47	46.47	46.07	24.67
Basic Pig Iron, GT	45.97	45.97	45.97	45.60	24.00
Malleable Pig Iron, GT.	47.27	47.27	47.27	47.27	25.29
Steelmaking Scrap, GT.	39.33	40.83	33.88	21.25	19.17

* Revised.

Weighted finished steel index based on average shipments and prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	June 15 1950	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.45	3.45	3.45	3.35	2.25
Bars, H.R., Chicago	3.45	3.45	3.45	3.35	2.25
Bars, C. F., Pittsburgh	4.10-15	4.10-15	4.10-15	3.95-4.00	2.65
Shapes, Std., Pittsburgh	3.40	3.40	3.40	3.25	2.10
Shapes, Std., Chicago	3.40	3.40	3.40	3.25	2.10
Plates, Pittsburgh	3.50	3.50	3.50	3.40	2.25
Plates, Chicago	3.50	3.50	3.50	3.40	2.25
Plates, Coatesville, Pa.	3.60	3.60	3.60	3.50	2.25
Plates, Sparrows Point, Md.	3.50	3.50	3.50	3.40	2.25
Plates, Claymont, Del.	3.60	3.60	3.60	3.50	2.25
Sheets, H.R., Pittsburgh	3.35	3.35	3.35	3.25	2.20
Sheets, H.R., Chicago	3.35	3.35	3.35	3.25	2.20
Sheets, C.R., Pittsburgh	4.10	4.10	4.10	4.00	3.05
Sheets, C.R., Chicago	4.10	4.10	4.10	4.00	3.05
Sheets, C.R., Detroit	4.30	4.30	4.30	4.20	3.15
Sheets, Galv., Pittsburgh	4.40	4.40	4.40	4.40	3.70
Strip, H.R., Pittsburgh	3.25	3.25	3.25	3.25	2.10
Strip, H.R., Chicago	3.25	3.25	3.25	3.25	2.10
Strip, C.R., Pittsburgh	4.15	4.15	4.15	4.00-75	2.80
Strip, C.R., Chicago	4.30	4.30	4.30	4.00-15	2.90
Strip, C.R., Detroit	4.35-40	4.35-40	4.35-40	4.20-45	2.90
Wire, Basic, Pittsburgh	4.50	4.50	4.50	4.15	2.75
Nails, Wire, Pittsburgh	5.30	5.30	5.30	5.15	2.90
Tin plate, box, Pittsburgh	$7.50	$7.50	$7.50	$7.75	$5.00

SEMIFINISHED

Billets, forging, Pitts. (NT)	$63.00	$63.00	$63.00	$61.00	$42.00
Sheet bar, mill (NT)	58.00	58.00	57.00-58.00	67.00	36.00
Wire rods, ½-⅝", Pitts.	3.85	3.85	3.85	3.775	2.15

PIG IRON, Gross Ton

Bessemer, Pitts.	$47.00	$47.00	$47.00	$47.00	$25.50
Basic, Valley	46.00	46.00	46.00	46.00	24.50
Basic, del. Phila.	49.44	49.44	49.44	49.39	26.34
No. 2 Fdry, Pitts.	46.50	46.50	46.50	46.50	25.00
No. 2 Fdry, Chicago	46.50	46.50	46.50	46.25	25.00
No. 2 Fdry, Valley	46.50	46.50	46.50	46.50	25.00
No. 2 Fdry, del. Phila.	49.94	49.94	49.94	49.89	26.84
No. 2 Fdry, Birm.	42.38	42.38	42.38	39.38	21.38
No. 2 Fdry. (Birm.)del.Cin.	49.08	49.08	49.08	45.43	25.06
Malleable, Valley	46.50	46.50	46.50	46.50	25.00
Malleable, Chicago	46.50	46.50	46.50	46.50	25.00
Charcoal, Lyles, Tenn.	60.00	60.00	60.00	66.00	33.00
Ferromanganese, Etna, Pa.	175.00	175.00	175.00	175.00	140.33*

* Delivered, Pittsburgh.

SCRAP, Gross Ton

No. 1 Heavy Melt. Pitts.	$45.00	$46.00	$38.00	$23.00	$20.00
No. 1 Heavy Melt. E. Pa.	35.50	36.50	29.00	19.25	18.25
No. 1 Heavy Melt. Chicago	37.50	40.00	34.50	21.50	18.75
No. 1 Heavy Melt. Valley	43.75	44.75	37.75	22.00	20.00
No. 1 Heavy Melt. Cleve.	41.75	42.75	34.25	18.50	19.50
No. 1 Heavy Melt. Buffalo	39.75	42.00	31.75	19.75	19.25
Rails, Rerolling, Chicago	49.50	52.50	48.50	27.75	22.25
No. 1 Cast, Chicago	47.00	48.50	42.50	27.50	20.00

COKE, Net Ton

Beehive, Furn., Connlsvl.	$14.25	$14.25	$14.25	$14.25	$7.50
Beehive, Fdry., Connlsvl.	15.50	15.50	16.00	16.25	8.25
Oven Fdry., Chicago	21.00	21.00	21.00	20.40	13.35

NONFERROUS METALS

Copper, del. Conn.	22.50	22.50	19.50	16.50	12.00
Zinc, E. St. Louis	14.50	14.50	12.00	9.00	8.25
Lead, St. Louis	11.80	11.80	11.80	11.85	6.35
Tin, New York	77.50	78.375	77.375	103.00	52.00
Aluminum, del.	17.50	17.50	17.00	17.00	15.00
Antimony, Laredo, Tex.	24.50	24.50	24.50	38.50	14.50
Nickel, refinery, duty paid	48.00	48.00	40.00	40.00	35.00

Pig Iron

For key to producing companies, turn next page.
Minimum delivered prices do not include 3% federal tax.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$48.00	$48.50	$49.00	$49.50
Newark, del.	50.63	51.13	51.63	52.13
Brooklyn, N.Y., del.	....	52.79	53.29	....
Birmingham District				
AlabamaCity, Ala. R2	41.88	42.38	....	....
Birmingham R2	41.88	42.38	....	....
Birmingham S9	41.88	42.38	....	....
Woodward, Ala. W15	41.88	42.38	....	....
Cincinnati, del.	....	49.08	....	....
Buffalo District				
Buffalo H1, R2	46.00	46.50	47.00	....
Tonawanda, N.Y., W12	46.00	46.50	47.00	....
N. Tonawanda, N.Y., T9	....	46.50	47.00	....
Boston, del.	55.26	55.76	56.20	....
Rochester, N.Y., del.	48.63	49.13	49.63	....
Syracuse, N.Y., del.	49.58	50.08	50.58	....
Chicago District				
Chicago I-3	46.00	46.50	46.50	47.00
Gary, Ind. C3	46.00	....	46.50	....
IndianaHarbor, Ind. I-2	46.00	....	46.50	....
So. Chicago, Ill. W14, Y1	46.00	46.50	46.50	....
So. Chicago, Ill. C3	46.00	....	46.50	47.00
Milwaukee, del.	47.89	48.39	48.39	48.89
Muskegon, Mich., del.	....	51.98	51.98	....
Cleveland District				
Cleveland A7	46.00	46.50	46.50	47.00
Cleveland R2	46.00	46.50	46.50	....
Akron, del. from Cleve.	48.39	48.89	48.89	49.39
Lorain, O. N3	46.00	....	....	47.00
Duluth I-3	....	....	46.50	....
Erie, Pa. I-3	46.00	46.50	46.50	47.00
Everett, Mass. E1	....	50.50	51.00	....
Fontana, Calif. K1	52.00	52.50	....	....
Geneva, Utah G1	46.00	46.50	....	....
Seattle, Tacoma, Wash., del.	....	54.20	....	....
Portland, Oreg., del.	....	54.20	....	....
LosAngeles, SanFrancisco, del.	53.70	54.20	....	....
GraniteCity, Ill. M10	47.90	48.40	48.90	....
St. Louis, del. (incl. tax)	48.65	49.15	49.65	....
Ironton, Utah C11	46.00	46.50	....	....
Minnequa, Colo. C10	47.00	47.50	47.50	....
Pittsburgh District				
NevilleIsland, Pa. P6	46.00	46.50	46.50	47.00
Pitts. N.&S. sides, Ambridge, Aliquippa, del.	47.19	47.69	47.69	48.19
McKeesRocks, del.	46.95	47.45	47.45	47.95
Lawrenceville, Homestead, McKeesport, Monaca, del.	47.44	47.94	47.94	48.44
Verona, del.	47.90	48.40	48.40	48.90
Brackenridge, del.	48.13	48.63	48.63	49.13
Bessemer, Pa. C3	46.00	....	46.50	47.00
Clairton, Rankin, So. Duquesne, Pa. C3	46.00	....	....	....
McKeesport, Pa. N3	46.00	....	....	47.00
Sharpsville, Pa. S6	46.00	46.50	46.50	47.00
Steelton, Pa. B2	48.00	48.50	49.00	49.50
Steubenville, O. W10	46.00	....	....	....
Struthers, O. S16	46.00	....	....	....
Swedeland, Pa. A3	48.00	48.50	49.00	49.50
Philadelphia, del.	49.44	49.94	50.44	50.94
Toledo, O. I-3	46.00	46.50	46.50	47.00
Cincinnati, del.	51.01	51.51	....	....
Troy, N.Y., R2	48.00	48.50	49.00	49.50
Youngstown District				
Hubbard, O. Y1	46.00	46.50	46.50	....
Youngstown C3	46.00	....	....	47.00
Youngstown Y1	46.00	46.50	46.50	47.00
Mansfield, O., del.	50.26	50.76	50.76	51.26

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%.

Phosphorous: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1%, or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.5% Si to 11.50%)

Jackson, O. G2, J1	$57.00
Buffalo H1	58.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for 0.045% max. P)

NiagaraFalls, N.Y. P15	$71.50
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	77.00
Keokuk, Iowa, OH & Fdry., 12½ lb. piglets, frt. allowed K2.	82.00
Wenatchee, Wash., OH & Fdry, frt. allowed K2	77.00

CHARCOAL PIG IRON, Gross Ton

(Low phos. semi-cold blast; differential charged from silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$60.00

LOW PHOSPHOROUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$51.00
Steelton, Pa. B2	54.00
Philadelphia delivered	57.00
Troy, N.Y. R2	54.00

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Semifinished and Finished Steel Products

Mill prices as reported to STEEL, June 15, 1950; cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Detroit R7 ..... $50.00
Munhall,Pa. C3 ..... 50.00

INGOTS, Alloy (NT)
Detroit R7 ..... $51.00
Houston,Tex. S5 ..... 59.00
Midland,Pa. C18 ..... 51.00
Munhall,Pa. C3 ..... 51.00
So.Duquesne,Pa. C3 ... 51.00

BILLETS, BLOOMS & Slabs
Carbon, Rerolling (NT)
Bessemer,Pa. C3 ..... $53.00
Clairton,Pa. C3 ..... 53.00
Conshohocken,Pa. A3 .. 58.00
Ensley,Ala. T2 ..... 53.00
Fairfield,Ala. T2 ..... 53.00
Fontana,Cal. K1 ..... 72.00
Gary,Ind. C3 ..... 53.00
Johnstown,Pa. B2 ..... 53.00
Lackawanna,N.Y. B2.. 53.00
Munhall, Pa. C3 ..... 53.00
Sharon,Pa. S3 ..... 57.00
So.Chicago,Ill. C3 .... 53.00
So.Duquesne,Pa. C3 ... 53.00

Carbon, Forging (NT)
Bessemer,Pa. C3 ..... $63.00
Buffalo R2 ..... 63.00
Canton,O. R2 ..... 63.00
Clairton,Pa. C3 ..... 63.00
Cleveland R2 ..... 63.00
Conshohocken,Pa. A3 .65.00
Detroit R7 ..... 66.00
Ensley,Ala. T2 ..... 63.00
Fairfield,Ala. T2 ..... 63.00
Fontana,Calif. K1 ..... 82.00
Gary,Ind. C3 ..... 63.00
Geneva,Utah G1 ..... 63.00
Houston,Tex. S5 ..... 71.00
Ind.Harbor,Ind. I-2 ... 63.00
Johnstown,Pa. B2 .... 63.00
Lackawanna,N.Y. B2.. 63.00
Los Angeles B3 ..... 82.00
Munhall,Pa. C3 ..... 63.00
Seattle B3 ..... 82.00
So.Chicago C3,R2,W14. 63.00
So.Duquesne,Pa. C3 .. 63.00
So.SanFrancisco B3 ... 82.00
Warren,O. C17 ..... 63.00

Alloy (NT)
Bethlehem,Pa. B2 .... $66.00
Buffalo R2 ..... 66.00
Canton,O. R2, T7 .... 66.00
Conshohocken,Pa. A3.. 68.00
Detroit R7 ..... 66.00
Fontana,Calif. K1 .... 85.00
Gary,Ind. C3 ..... 66.00
Houston,Tex. S5 ..... 74.00
Ind.Harbor,Ind. Y1 ... 66.00
Johnstown,Pa. B2 .... 66.00
Lackawanna,N.Y. B2 .. 66.00
LosAngeles B3 ..... 86.00
Massillon,O. R2 ..... 66.00
Midland,Pa. C18 ..... 66.00
Munhall,Pa. C3 ..... 66.00
Sharon,Pa. S3 ..... 66.00
So.Chicago C3,R2,W14. 66.00
So.Duquesne,Pa. C3 .. 66.00
Warren,O. C17 ..... 66.00
Youngstown Y1 ..... 66.00

SHEETS BARS (NT)
Mansfield,O. E6 ..... $58.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 ..... $76.00
Cleveland R2 ..... 76.00
Gary,Ind. C3 ..... 76.00
Ind.Harbor,Ind. I-2 ... 76.00
Massillon,O. R2 ..... 76.00
So.Chicago,Ill. R2 .... 76.00
So.Duquesne,Pa. C3 .. 76.00

SKELP
Aliquippa,Pa. J5 ..... 3.25
Munhall,Pa. C3 ..... 3.15
Warren,O. R2 ..... 3.15
Youngstown C3, R2 .... 3.15

WIRE RODS
AlabamaCity,Ala. R2 .. 3.85
Buffalo W12 ..... 3.85
Cleveland A7 ..... 3.85
Donora,Pa. A7 ..... 3.85
Fairfield,Ala. T2 ..... 3.85
Houston,Tex. S5 ..... 4.25
Ind.Harbor,Ind. Y1 .... 3.85
Johnstown,Pa. B2 .... 3.85
Joliet,Ill. A7 ..... 3.85
LosAngeles B3 ..... 4.65
Minnequa,Colo. C10 .... 4.10
Monessen,Pa. P7 ..... 3.85
No.Tonawanda,N.Y. B11. 4.10
Pittsburg,Calif. C11 ... 4.50
Portsmouth,O. P12 .... 3.85
Roebling,N.J. R5 ..... 3.95
So.Chicago,Ill. R2 .... 3.85
SparrowsPoint,Md. B2.. 3.95
Sterling,Ill.(1) N15 .... 3.85
Struthers,O. Y1 ..... 3.85
Torrance,Calif. C11 .... 4.65
Worcester A7 ..... 4.15

STRUCTURALS
Carbon Steel Stand. Shapes
Aliquippa,Pa. J5 ..... 3.40
Bessemer,Ala. T2 ..... 3.40
Bethlehem,Pa. B2 ..... 3.45
Clairton,Pa. C3 ..... 3.40
Fairfield,Ala. T2 ..... 3.40
Fontana,Calif. K1 ..... 4.00
Gary,Ind. C3 ..... 3.40
Geneva,Utah G1 ..... 3.40
Houston, Tex. S5 ..... 3.80
Ind.Harbor,Ind. I-2 .... 3.40
Johnstown,Pa. B2 ..... 3.45
KansasCity,Mo. S5 .... 4.00
Lackawanna,N.Y. B2 .. 3.45
LosAngeles B3 ..... 4.00
Minnequa,Colo. C10 .... 3.75
Munhall,Pa. C3 ..... 3.40
Niles,Calif.(22) P1 .... 4.02
Phoenixville,Pa. P4 .... 3.30
Portland,Oreg. O4 ..... 3.90
Seattle B3 ..... 4.05
So.Chicago,Ill. C3 W14. 3.40
So.SanFrancisco B3 .... 3.95
Torrance,Calif. C11 .... 4.00
Weirton,W.Va. W6 ..... 3.40

Alloy Stand. Shapes
Clairton,Pa. C3 ..... 4.05
Fontana,Calif. K1 ..... 5.25
Munhall,Pa. C3 ..... 4.05
So.Chicago,Ill. C3 ..... 4.05

H.S. Low-Alloy Stand. Shapes
Aliquippa,Pa. J5 ..... 5.15
Bessemer,Ala. T2 ..... 5.15
Bethlehem,Pa.(14) B2 .. 5.20
Clairton,Pa. C3 ..... 5.15
Fairfield,Ala. T2 ..... 5.15
Fontana,Calif. K1 ..... 5.75
Gary,Ind. C3 ..... 5.15
Ind.Harbor,Ind. I-2, Y1. 5.15
Johnstown,Pa. B2 ..... 5.20
Lackawanna,N.Y.(14)B2 5.20
Munhall,Pa. C3 ..... 5.15
So.Chicago,Ill. C3 ..... 5.15
Struthers,O. Y1 ..... 5.15

Wide Flange
Bethlehem,Pa. B2 ..... 3.45
Lackawanna,N.Y. B2 .. 3.45
Munhall,Pa. C3 ..... 3.40
So.Chicago,Ill. C3 ..... 3.40

H.S., L.A Wide Flange
Munhall,Pa. C3 ..... 5.10
So.Chicago,Ill. C3 ..... 5.10

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 .... 4.20
Lackawanna,N.Y. B2 .. 4.20
Munhall,Pa. C3 ..... 4.20
So.Chicago,Ill. C3 ..... 4.20
Weirton,W.Va. W6 .... 4.20

BEARING PILES
Munhall,Pa. C3 ..... 3.40
So.Chicago,Ill. C3 ..... 3.40

PLATES, Carbon Steel
AlabamaCity,Ala. R2 .. 3.50
Aliquippa,Pa. J5 ..... 3.50
Ashland,Ky.(15) A10 .. 3.50
Bessemer,Ala. T2 ..... 3.50
Clairton,Pa. C3 ..... 3.50
Claymont,Del. W16 .... 3.60
Cleveland J5, R2 ..... 3.50
Coatesville,Pa. L7 .... 3.60
Conshohocken,Pa. A3 .. 3.60
Ecorse,Mich. G5 ..... 3.75
Fairfield,Ala. T2 ..... 3.50
Fontana,Calif. K1 ..... 4.10
Gary,Ind. C3 ..... 3.50
Geneva,Utah G1 ..... 3.50
Harrisburg,Pa. C5 .... 3.85
Houston,Tex. S5 ..... 3.90
Ind.Harbor,Ind. I-2,Y1. 3.50
Johnstown,Pa. B2 ..... 3.50
Lackawanna,N.Y. B2 .. 3.50
Minnequa,Colo. C10 .... 4.30
Munhall,Pa. C3 ..... 3.50
Pittsburgh J5 ..... 3.50
Seattle B3 ..... 4.40
Sharon,Pa. S3 ..... 3.50
So.Chicago,Ill. C3, W14. 3.50
SparrowsPoint,Md. B2.. 3.50
Steubenville,O. W10 .... 3.50
Warren,O. R2 ..... 3.50
Weirton,W.Va. W6 .... 3.50
Youngstown C3, R2 Y1. 3.50

PLATES (Universal Mill)
Fontana,Calf. K1 ..... 4.40

PLATES, Carbon A.R.
Fontana,Calif. K1 .... 5.25

PLATES, Open-Hearth Alloy
Coatesville,Pa. L7 .... 4.50
Conshohocken,Pa. A3 .. 4.40
Fontana,Calif. K1 ..... 5.40
Gary,Ind. C3 ..... 4.40
Johnstown,Pa. B2 ..... 4.40
Munhall,Pa. C3 ..... 4.40
Sharon,Pa. S3 ..... 4.40
So.Chicago,Ill. C3 ..... 4.40
SparrowsPoint,Md. B2 .. 4.40

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 ..... 5.35
Bessemer,Ala. T2 ..... 5.35
Clairton,Pa. C3 ..... 5.35
Cleveland J5, R2 ..... 5.35
Conshohocken,Pa. A3 .. 5.35
Ecorse,Mich. G5 ..... 5.60
Fairfield,Ala. T2 ..... 5.35
Fontana,Calif. K1 ..... 5.95
Gary,Ind. C3 ..... 5.35
Geneva,Utah G1 ..... 5.35
Houston,Tex. S5 ..... 5.60
Ind.Harbor,Ind. I-2, Y1. 5.35
Johnstown,Pa. B2 ..... 5.35
Munhall,Pa. C3 ..... 5.35
Pittsburgh J5 ..... 5.35
Sharon,Pa. S3 ..... 5.35
So.Chicago,Ill. C3 ..... 5.35
SparrowsPoint,Md. B2.. 5.35
Warren,O. R2 ..... 5.35
Youngstown Y1 ..... 5.35

FLOOR PLATES
Cleveland J5 ..... 4.55
Conshohocken,Pa. A3 .. 4.55
Harrisburg,Pa. C5 .... 4.55
Ind.Harbor,Ind. I-2 .... 4.55
Munhall,Pa. C3 ..... 4.55
So.Chicago,Ill. C3 ..... 4.55

PLATES, Ingot Iron
Ashland,c.l.(15) A10 ... 3.75
Ashland,lcl(15) A10 ... 4.25
Cleveland,cl R2 ..... 4.10
Warren,O.cl R2 ..... 4.10

PLATES, Wrought Iron
Economy,Pa. B14 ..... 7.85

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 .. 3.45
Aliquippa,Pa. J5 ..... 3.45
Alton,Ill.(1) L1 ..... 3.45
Ashland,Ky.(17) A10 .. 3.45
Atlanta,Ga A11 ..... 3.60
Bessemer,Ala T2 ..... 3.45
Buffalo R2 ..... 3.45
Canton,O. R2 ..... 3.45
Clairton,Pa. C3 ..... 3.45
Cleveland R2 ..... 3.45
Ecorse,Mich. G5 ..... 3.65
Emeryville,Calif. J7 ... 4.20
Fairfield,Ala. T2 ..... 3.45
Fontana,Calif. K1 ..... 4.10
Gary,Ind. C3 ..... 3.45
Houston,Tex. S5 ..... 3.85
Ind.Harbor,Ind. I-2, Y1. 3.45
Johnstown,Pa. B2 ..... 3.45
KansasCity,Mo. S5 .... 4.05
Lackawanna,N.Y. B2 .. 3.45
LosAngeles B3 ..... 4.15
Midland,Pa. C18 ..... 3.45
Milton,Pa. B6 ..... 3.45
Minnequa,Colo. C10 .... 3.85
Niles,Calif. P1 ..... 4.17
N.Tonawanda,N.Y. B11. 3.45
Pittsburg,Calif. C11 .... 4.15
Pittsburgh J5 ..... 3.45
Portland,Oreg. O4 ..... 4.20
Seattle B3, N14 ..... 4.20
So.Chicago C3, R2, W14. 3.45
So.Duquesne,Pa. C3 .... 3.45
S.SanFran.,Cal. B3 .... 4.20
Struthers,O. Y1 ..... 3.45
Torrance,Calif. C11 .... 4.15
Weirton,W.Va. W6 .... 3.45
Youngstown C3, R2 .... 3.45

BAR SIZE ANGLES; S. SHAPES
Aliquippa,Pa. J5 ..... 3.45
Atlanta A11 ..... 3.60
Johnstown,Pa. B2 ..... 3.45
Lackawanna,N.Y. B2 .. 3.45
Niles,Calif. P1 ..... 4.17
Pittsburgh(23) J5 ..... 3.45
Portland,Oreg. O4 ..... 4.20
SanFrancisco S7 ..... 4.00
Weirton,W.Va. W6 .... 3.45

BAR SIZE ANGLES; H.R.CARBON
Bethlehem,Pa. B2 ..... 3.65

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 ..... 3.95
Buffalo R2 ..... 3.95
Canton,O. R2, T7 ..... 3.95
Clairton,Pa. C3 ..... 3.95
Ecorse,Mich. G5 ..... 4.25
Fontana,Calif. K1 ..... 4.95
Gary,Ind. C3 ..... 3.95
Houston,Tex. S5 ..... 4.35
Ind.Harbor,Ind. I-2, Y1. 3.95
Johnstown,Pa. B2 ..... 3.95
KansasCity,Mo. S5 .... 4.55
Lackawanna,N.Y. B2 .. 3.95
LosAngeles B3 ..... 5.00
Massillon,O. R2 ..... 3.95
Midland,Pa. C18 ..... 3.95
So.Chicago C3, R2, W14. 3.95
So.Duquesne,Pa. C3 .... 3.95
Struthers,O. Y1 ..... 3.95
Warren,O. C17 ..... 3.95
Youngstown C3 ..... 3.95

BARS, Hot-Rolled Ingot Iron
Ashland,Ky.(17) A10 .. 3.70

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 ..... 5.20
Atlanta A11 ..... 5.35
Bessemer,Ala. T2 ..... 5.20
Bethlehem,Pa. B2 ..... 5.20
Clairton,Pa. C3 ..... 5.20
Cleveland R2 ..... 5.20
Ecorse,Mich. G5 ..... 5.40
Fairfield,Ala. T2 ..... 5.20
Fontana,Calif. K1 ..... 6.25
Gary,Ind. C3 ..... 5.20
Ind.Harbor,Ind. I-2, Y1. 5.20
Johnstown,Pa. B2 ..... 5.20
Lackawanna,N.Y. B2 .. 5.20
Pittsburgh J5 ..... 5.20
So.Duquesne,Pa. C3 .... 5.20
Struthers,O. Y1 ..... 5.20
Youngstown C3 ..... 5.20

BARS, Cold-Finished Carbon
Aliquippa,Pa. K5 ..... 4.15
Ambridge,Pa. W18 ..... 4.15
BeaverFalls,Pa. M12,R2. 4.15
Buffalo B5 ..... 4.15
Camden,N.J. P13 ..... 4.63
Carnegie,Pa. C12 ..... 4.15
Chicago W18 ..... 4.15
Cleveland A7, C20 .... 4.15
Detroit P17 ..... 4.30
Donora,Pa. A7 ..... 4.15
Ecorse,Mich. G5 ..... 4.35
Elyria,O. W8 ..... 4.15
FranklinPark,Ill. N5 .... 4.15
Gary,Ind. R2 ..... 4.15
Hammond,Ind. L2, M13. 4.15
Hartford,Conn. R2 ..... 4.55
Harvey,Ill. B5 ..... 4.15
LosAngeles R2 ..... 5.55
Mansfield,Mass. B5 .... 4.55
Massillon,O. R2, R8 .... 4.15
Midland,Pa. C18 ..... 4.15
Monaca,Pa. S17 ..... 4.15
Newark,N.J. W18 ..... 4.55
Plymouth,Mich. P5 .... 4.40
Pittsburgh J5 ..... 4.10
Putnam,Conn. W18 .... 4.55
Readville,Mass. C14 .... 4.55
St.Louis,Mo. M5 ..... 4.55
So.Chicago,Ill. W14 .... 4.15
SpringCity,Pa.(5) K3 .. 4.55
Struthers,O. Y1 ..... 4.15
Waukegan,Ill. A7 ..... 4.15
Youngstown F3, Y1 .... 4.15

BARS, Cold-Finished Alloy
Aliquippa,Pa. K5 ..... 4.90
Ambridge,Pa. W18 .... 4.90
BeaverFalls,Pa. M12 .. 4.90
Bethlehem,Pa. B2 ..... 4.90
Buffalo B5 ..... 4.90
Canton,O. R2, T7 ..... 4.90
Carnegie,Pa. C12 ..... 4.90
Chicago W18 ..... 4.90
Cleveland A7, C20 ..... 4.90
Detroit P17 ..... 5.05
Donora,Pa. A7 ..... 4.90
Elyria,O. W8 ..... 4.90
Gary,Ind. R2 ..... 4.90
Hammond,Ind. L2, M13. 4.90
Hartford,Conn. R2 ..... 5.20
Harvey,Ill. B5 ..... 4.90
Lackawanna,N.Y. B2 .. 4.90
Mansfield,Mass. B5 .... 5.20
Massillon,O. R2, R8 .... 4.90
Midland,Pa. C18 ..... 4.90
Monaca,Pa. S17 ..... 4.90
Newark,N.J. W18 ..... 5.20
Plymouth,Mich. P5 ..... 5.10
So.Chicago,Ill. R2, W14. 4.90
Struthers,O. Y1 ..... 4.90
Waukegan,Ill. A7 ..... 4.90
Warren,O. C17 ..... 4.90
Worcester,Mass A7 ..... 5.20
Youngstown F3, Y1 .... 4.90

RAIL STEEL BARS
ChicagoHts. (3) C2, I-2. 3.30
ChicagoHts. (4) C2, I-2. 3.45
Franklin,Pa. (3) F5 ... 3.30
Franklin,Pa. (4) F5 ... 3.45
FortWorth,Tex.(26) T4. 4.33
Huntngtn,W.Va.(3) W7. 3.45
Moline,Ill.(3) R2 ..... 3.40
SouthAvis,Pa.(2) J8 ... 3.30
SouthAvis,Pa.(41) J8 .. 3.30
SouthAvis,Pa.(42) J8 .. 3.30
Williamsport(2,3) S19 .. 3.45

BARS, Wrought Iron
Economy,Pa.(S.R.) B14. 9.50
Economy,Pa.(D.R.)B14 11.00
Economy,(Staybolt)B14 11.30
Dover,N.J.(Staybolt)U1 15.00
Dover(Eng.Bolt) U1 ..13.50
Dover(Wrgt.Iron) U1..12.25
McK.Rks.(S.R.) L5 ....8.60
McK.Rks.(D.R.) L5 ...11.25
McK.Rks.(Staybolt) L5.12.75

BARS, Reinforcing
(Fabricated; to Consumers)
Huntington,W.Va. W7 ..4.50
Johnstown, ¼-1" B2 ...4.35
LosAngeles B3 ..... 5.00
Seattle B3, N14 ..... 5.10
SouthAvis,Pa. J8 ..... 4.35
So.SanFrancisco B3 .... 5.00
SparrowsPt., ¼-1" B2 ..4.35
Williamsport,Pa. S19 ..4.35

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..3.45
Alton,Ill.(6) L1 ..... 3.45
Atlanta A11 ..... 3.60
Buffalo R2 ..... 3.45
Cleveland R2 ..... 3.45
Emeryville,Calif. J7 ...4.20
Fairfield,Ala. T2 ..... 3.45
Fontana,Calif. K1 ..... 4.10
Gary,Ind. C3 ..... 3.45
Houston,Tex. S5 ..... 3.85
Ind.Harbor,Ind. I-2,Y1..3.45
Johnstown,Pa. B2 ..... 3.45
KansasCity,Mo. S5 .... 4.05
Lackawanna,N.Y. B2 ..3.45
LosAngeles B3 ..... 4.15
Milton,Pa. B6 ..... 3.45
Minnequa,Colo. C10 .... 4.25
Niles,Calif. P1 ..... 4.17
Pittsburg,Calif. C11 ...4.15
Pittsburgh J5 ..... 3.45
Portland,Oreg. O4 ..... 4.20
SandSprings,Okla. S5 ..4.35
Seattle,Wash. B3, N14..4.20
SouthAvis,Pa. J8 ..... 3.45
So.Chicago,Ill. R2 ..... 3.45
So.Duquesne,Pa. C3 .... 3.45
So.SanFrancisco B3 ...4.20
SparrowsPoint,Md. B2..3.45
Struthers,O. Y1 ..... 3.45
Torrance,Calif. C11 ....4.15
Youngstown C3, R2 ....3.45

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. C3 ..... 4.20
Fontana,Calif. K1 ..... 4.95
Gary,Ind. C3 ..... 4.20
Youngstown C3 ..... 4.20

SHEETS, Hot-Rolled Steel (18 gage and heavier)
AlabamaCity,Ala. R2 ..3.35
Ashland,Ky.(8) A10 ...3.35
Butler,Pa. A10 ..... 3.35
Cleveland J5, R2 ..... 3.35
Conshohocken,Pa. A3 ..3.45
Detroit M1 ..... 4.15
Ecorse,Mich.(8) G5 ....3.55
Fairfield,Ala. T2 ..... 3.35
Fontana,Calif. K1 ..... 4.25
Gary,Ind. C3 ..... 3.35
Ind.Harbor,Ind. I-2, Y1.3.35
Irvin,Pa. C3 ..... 3.35
Lackawanna,N.Y. B2 ..3.35
Munhall,Pa. C3 ..... 3.35
Niles,O. M4 ..... 3.75
Pittsburg,Calif. C11 ...4.05
Pittsburgh J5 ..... 3.35
Sharon,Pa. S3 ..... 3.50
So.Chicago,Ill. W14 .... 3.35
SparrowsPoint,Md. B2 ..3.35
Steubenville,O. W10 .... 3.35
Torrance,Calif. C11 ....4.05
Warren,O. R2 ..... 3.35
Weirton,W.Va. W6 ..... 3.35
Youngstown C3, Y1 ....3.35

SHEETS, Hot-Rolled Carbon Steel (19 gage and lighter)
AlabamaCity,Ala. R2 ..4.50
Dover,O. R1 ..... 4.65
Ind.Harbor,Ind. I-2 ....4.40
Mansfield,O. E6 ..... 4.15
Niles,O. N12 ..... 4.10
Niles,O. M4 ..... 4.65
Torrance,Calif. C11 ....5.15

SHEETS, H-R (14 ga., heavier) High-Strength Low-Alloy
Cleveland J5, R2 ..... 5.05
Conshohocken,Pa. A3 ..5.05
Ecorse,Mich. G5 ..... 5.25
Fairfield,Ala. T2 ..... 5.05
Fontana,Calif. K1 ..... 6.74
Gary,Ind. C3 ..... 5.05
Ind.Harbor,Ind. I-2, Y1.5.05
Irvin,Pa. C3 ..... 5.05
Lackawanna(35) B2 ...5.05
Pittsburgh J5 ..... 5.05
Sharon,Pa. S3 ..... 5.05
So.Chicago,Ill. C2 ..... 5.05
SparrowsPoint(36) B2 ..5.05
Warren,O. R2 ..... 5.05
Weirton,W.Va. W6 ..... 5.05
Youngstown, C3, Y1 ...5.05

SHEETS, Cold-Rolled High-Strength Low-Alloy
Cleveland J5, R2 ..... 6.20
Ecorse,Mich. G5 ..... 6.40
Fontana,Calif. K1 ..... 7.05
Gary,Ind. C3 ..... 6.20
Ind.Harbor,Ind. I-2, Y1.6.20
Irvin,Pa. C3 ..... 6.20
Lackawanna(37) B2 ...6.20
Pittsburgh J5 ..... 6.20
Sharon,Pa. S3 ..... 6.20
SparrowsPoint(38) B2..6.20
Warren,O. R2 ..... 6.20
Weirton,W.Va. W6 .... 6.20
Youngstown Y1 ..... 6.20

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.10
Cleveland J5, R2	4.10
Ecorse,Mich. G5	4.30
Fairfield,Ala. T2	4.10
Follansbee,W.Va. F4	5.10
Fontana,Calif. K1	5.00
Gary,Ind. C3	4.10
GraniteCity,Ill. G4	4.30
Ind.Harbor,Ind. I-2, Y1	4.10
Irvin,Pa. C3	4.10
Lackawanna,N.Y. B2	4.10
Middletown,O. A10	4.10
Pittsburg,Calif. C11	5.05
Pittsburgh J5	4.10
SparrowsPoint,Md. B2	4.10
Steubenville,O. W10	4.10
Warren,O. R2	4.10
Weirton,W.Va. W6	4.10
Youngstown Y1	4.10

SHEETS, Gal'vd No. 10 Steel

AlabamaCity,Ala. R2	4.40
Ashland,Ky.(8) A10	4.40
Canton,O. R2	4.40
Delphos,O. N16	5.15
Dover,O. R1	4.75
Fairfield,Ala. T2	4.40
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	4.60
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Kokomo,Ind. C16	4.50
MartinsFerry,O. W10	4.40
Niles,O. N12	4.65
Pittsburg,Calif. C11	5.15
SparrowsPoint,Md. B2	4.40
Steubenville,O. W10	4.40
Torrance,Calif. C11	5.15
Weirton,W.Va. W6	4.40

SHEETS, Galvanized No. 10, High-Strength Low Alloy

Irvin,Pa. C3	6.75
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	4.95
Irvin,Pa. C3	4.95
Kokomo,Ind. C16	5.05
Niles,O. N12	5.20

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	4.65
Middletown,O. A10	4.65

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.25
Niles,O. R2 (28)	5.25
Weirton,W.Va. W6	5.10

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.05

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va. W10	4.80
Gary,Ind. C3	4.80
Mansfield,O. E6	4.80
Middletown,O. A10	4.80
Niles,O. N12	4.80
Weirton,W.Va. W6	4.80

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.20

ROOFING SHORT TERNES (Package; 8 lb coated)

Gary,Ind. C3	$17.50
Yorkville,O. W10	17.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$6.45
Gary,Ind. C3	6.35
Irvin,Pa. C3	6.35
SparrowsPoint,Md. B2	6.45
Yorkville,O. W10	6.35

SHEETS, Lt. Coated Ternes, 6 lb

Yorkville,O. W10	$7.05

SHEETS, Mfg. Ternes, 8 lb

Gary,Ind. C3	$8.10
Warren,O. R2	8.10
Yorkville,O. W10	8.10

SHEETS, Culvert No. 16	Cu Alloy	Cu Fe
Ashland A10	5.20	...
Canton,O. R2	5.25	5.70
Fairfield,Ala. T2	5.20	5.45
Gary C3	5.20	5.45
IndianaHarbor I-2	5.20	5.45
Irvin,Pa. C3	5.20	5.45
Kokomo C16	5.40	...
MartinsFy,O. W10	5.20	5.45
Pittsburg,Cal. C11	5.95	...
SparrowsPt. B2	5.20	...
Torrance,Cal. C11	5.95	...

SHEETS,Culvert, No. 16 Corrugated Ingot Iron

Ashland,Ky. A10	5.45

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.60
Cleveland R2	3.95
Ind.Harbor,Ind. I-2	3.60
Warren,O. R2	3.95

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.70
Middletown,O. A10	4.60
Warren,O. R2	4.70

SHEETS, Galvanized Ingot Iron No. 10 Flat

Ashland,Ky(8) A10	4.65
Canton,O. R2	5.15
Ind.Harbor,Ind. I-2	4.80

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	4.90
Middletown,O. A10	4.90

SHEETS, WROUGHT IRON	An'ld	Galv.
Apollo,Pa. B14	12.00	15.50

SHEETS, Well Casing

Torrance,Calif. C11	4.85

SHEETS, Drum Body

Pittsburg,Calif. C11	4.05
Torrance, Calif. C11	4.05

SHEETS, Aluminized

Butler,Pa. A10	7.75

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$6.35	$6.60	$6.85
Fairfield,Ala. T2	6.45	6.70	6.95
Gary,Ind. C3	6.35	6.60	6.85
GraniteCity,Ill. G4	6.55	6.80	7.05
Ind.Harbor,Ind. I-2, Y1	6.35	6.60	6.85
Irvin,Pa. C3	6.35	6.60	6.85
Niles,O. R2	6.35	6.60	6.85
Pittsburg,Calif. C11	7.10	7.35	7.60
SparrowsPoint,Md. B2	6.45	6.70	6.95
Weirton, W. Va. W6	6.35	6.60	6.85
Yorkville,O. W10	6.35	6.60	6.85

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom W10 (cut lengths)	...	...	6.70	7.95	8.75
Brackenridge,Pa. A4	...	...	7.20	8.45	9.25
GraniteCity,Ill. G4(cut lengths)	...	...	6.90	8.15	...
Ind.Harbor,Ind. I-2	6.40	6.70	(34)	...	...
Mansfield,O. E6 (cut lengths)	5.90	6.20	6.70	7.95	8.75
Niles,O. N12 (cut lengths)	...	6.20	6.70	...	...
Niles,O. M4 (24 Gage)	5.65	5.95	6.45	...	...
Parkersburg F4 (cut lengths)	...	...	6.70	7.95	8.75
Vandergrift,Pa. C3	...	6.70	7.20	8.45	9.25
Warren,O. R2	6.40	6.70	7.20	8.45	9.25
Zanesville,O. A10	...	6.70	7.20	8.45	9.25

SHEETS, SILICON (22 Gage Base) Coils (Cut Lengths ½c lower) Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.30	9.85	10.55	11.35
Brackenridge,Pa. A4	9.80	10.35	11.05	....
Parkersburg F4 (cut lengths)	9.30	....	....	....
Vandergrift,Pa. C3	9.80	10.35	11.05	11.85
Warren,O. R2	9.80	....	....	....
Zanesville,O. A10	9.80	10.35	11.05	11.85

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)	T-100	T-90	T-80	T-73
Vandergrift,Pa. C3	12.35	13.20	14.20	14.70

TIN PLATE, American COKE (Base Box)	1.25 lb	1.50 lb
Aliquippa J5	$7.30	$7.50
Fairfield,Ala. T2	7.40	7.60
Gary C3	7.30	7.50
Gran.City,Ill. G4	7.50	7.70
Ind.Harbor I-2, Y1	7.30	7.50
Irvin,Pa. C3	7.30	7.50
Pitts.Cal. C11	8.05	8.25
Sp.Pt.,Md. B2	7.40	7.60
Warren R2	7.30	7.50
Weirton W6	7.30	7.50
Yorkville,O. W10.	7.30	7.50

CANMAKING BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$5.60
Fairfield,Ala. T2	5.70
Gary,Ind. C3	5.60
GraniteCity,Ill. G4	5.80
Ind.Harbor,Ind. I-2, Y1	5.60
Irvin,Pa. C3	5.60
Niles,O. R2	5.60
Pittsburg,Calif. C11	6.35
SparrowsPoint,Md. B2	5.70
Warren,O. R2	5.60
Weirton,W.Va. W6	5.60
Yorkville,O. W10	5.60

HOLLOWARE ENAMELING Black Plate (29 gage)

Aliquippa,Pa. J5	5.30
Follansbee,W.Va. F4	5.30
Gary,Ind. C3	5.30
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. C3	5.30
Niles,O. R2	5.30
SparrowsPoint,Md. B2	5.40
Warren,O. R2	5.30
Yorkville,O. W10	5.30

SHEETS, Enam'lg. Iron

Ashland,Ky.(8) A10	4.40
Cleveland R2	4.40
Ecorse,Mich. G5	4.70
Gary,Ind. C3	4.40
GraniteCity,Ill. G4	4.60
Ind.Harbor,Ind. I-2	4.40
Irvin,Pa. C3	4.40
Middletown,O. A10	4.40
Niles,O. M4	4.90
Youngstown Y1	4.40

STRIP, Hot-Rolled, High-Strength Low-Alloy

Atlanta(9) A11	5.10
Bessemer,Ala. T2	4.95
Conshohocken,Pa. A3	4.95
Ecorse,Mich. G5	5.15
Fairfield,Ala. T2	4.95
Fontana,Cal. K1	6.64
Gary,Ind. C3	4.95
Ind.Harb.,Ind. I-2, Y1	4.95
Lackawanna,N.Y. B2	4.95
Sharon,Pa. S3	4.95
SparrowsPoint,Md. B2	4.95
Warren,O. R2	4.95
Weirton,W.Va. W6	4.95
Youngstown C3, Y1	4.95

STRIP, Hot-Rolled Alloy

Bridgeprt,Conn.(10)	S15.5.10
Carnegie,Pa, S18	5.10
Fontana,Calif. K1	6.30
Gary,Ind. C3	5.10
Houston,Tex. S5	5.50
KansasCity,Mo. S5	5.70
NewBritn,Conn.(10)	S15.5.10
Sharon,Pa. S3	5.10
Youngstown C3	5.10

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.50
Warren,O. R2	3.85

STRIP, Hot-Rolled Carbon

Alton,Ill.(1) L1	3.25
Ashland,Ky.(8) A10	3.25
Atlanta A11	3.40
Bessemer,Ala. T2	3.25
Bridgeprt,Conn.(10) S15	*3.50*
Butler,Pa. A10	3.25
Carnegie,Pa. S18	*3.50*
Conshohocken,Pa. A3	3.35
Detroit M1	4.05
Ecorse,Mich. G5	3.45
Fairfield,Ala. T2	3.25
Fontana,Calif. K1	4.40
Gary,Ind. C3	3.25
Houston,Tex. S5	3.65
Ind.Harbor,Ind. I-2, Y1	3.25
KansasCity,Mo.(9) S5	3.85
Lackawanna,N.Y. B2	3.25
LosAngeles B3	4.00
Milton,Pa. B6	3.25
Minnequa,Colo. C10	4.30
NewBritain(10) S15	*3.50*
N.Tonawanda,N.Y. B11	3.25
Pittsburg,Calif. C11	4.00
Riverdale,Ill. A1	3.25
SanFrancisco S7	4.00
Seattle B3, N14	4.25
Sharon,Pa. S3	3.50
So.Chicago,Ill. W14	3.25
So.SanFrancisco B3	4.00
SparrowsPoint,Md. B2	3.25
Torrance,Calif. C11	4.00
Warren,O. R2	3.25
Weirton,W.Va. W6	3.25
WestLeechburg,Pa. A4	3.25
Youngstown C3, Y1	3.25

STRIP, Cold-Rolled Alloy Steel

Bridgprt,Conn.(10) S15	9.50
Carnegie,Pa. S18	9.50
Cleveland A7	9.50
Dover,O. G6	9.50
Harrison,N.J. C18	9.50
NewBritn,Conn.(10) S15	9.50
Pawtucket,R.I.(11) N8	9.50
Pawtucket,R.I.(12) N8	9.80
Sharon,Pa. S3	9.50
Worcester,Mass. A7	9.80
Youngstown C8	9.50

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	4.75

STRIP, Cold-Finished, Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Bridgeport,Conn.(10) S15	4.15	5.95	6.55	8.50	10.80
Bristol,Conn. W1	...	...	6.85	8.80	....
Carnegie,Pa. S18	...	5.95	6.55	8.50	10.80
Cleveland A7	4.15	5.95	6.55	8.50	10.80
Dover,O. G6	4.15	5.95	6.55	8.50	10.80
FranklinPark,Ill. T6	4.40	6.10	6.70	8.65	....
Harrison,N.J. C18	...	...	6.85	8.80	11.10
Mattapan,Mass. T6	4.65	6.25	6.85	8.80	11.10
NewBritn.,Conn.(10) S15	4.15	5.95	6.55	8.50	10.80
NewCastle,Pa. B4	4.15	5.95	6.55	8.50	....
NewCastle,Pa. E5	4.15	5.95	6.55	8.50	10.80
NewYork W3	...	6.30	6.90	8.85	11.15
Pawtucket,R.I. N8: Cleve.orPitts.Base	4.70	5.95	6.55	8.50	10.80
Worcester,Base	4.65	6.25	6.85	8.80	11.10
Sharon,Pa. S3	4.15	5.95	6.55	8.50	10.80
Trenton,N.J. R5	...	6.25	6.85	8.80	11.10
Wallingford,Conn. W2	4.65	6.25	6.85	8.80	11.10
Weirton,W.Va. W6	4.15	5.95	6.55	8.50	10.80
Worcester,Mass. A7	4.45	6.25	6.85	8.80	11.10
Worcester,Mass. T6	4.65	6.25	6.85	8.80	11.10
Youngstown C8	4.50	5.95	6.55	8.50	10.80
Spring Steel (Tempered)					
Trenton,N.J. R5	...	...	9.30	11.25	13.85
Harrison,N.J. C18	...	...	9.30	11.25	13.85

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	4.15
Berea,O. C7	6.60
Bridgprt,Conn.(10) S15	*4.50*
Butler,Pa. A10	4.15
Cleveland A7, J5	4.15
Dearborn,Mich. D3	4.75
Detroit D2	*4.75*
Detroit M1	4.95
Dover,O.(40) G6	4.15
Ecorse,Mich. G5	4.35
Follansbee,W.Va. F4	4.50
Fontana,Calif. K1	5.40
FranklinPark,Ill. T6	4.30
Ind.Harbor,Ind. I-2	4.30
Lackawanna,N.Y. B2	4.15
LosAngeles C1	5.50
Mattapan,Mass.(21) T6	4.65
Middletown,O. A10	4.15
NewBritain(10) S15	*4.50*
NewCastle,Pa. B4	4.50
NewCastle,Pa.(40) E5	4.15
NewHaven,Conn. D2	*5.00*
NewHaven,Conn. A7	4.65
NewYork W3	5.00
Pawtucket,R.I. R3	4.50
Pawtucket,R.I.(21) N8	*5.00*
Riverdale,Ill. A1	4.30
Rome,N.Y. R6	4.15
Sharon,Pa. S3	4.50
SparrowsPoint,Md. B2	4.15
Trenton,N.J.(13) R5	4.65
Wallingford,Conn. W2	*5.00*
Warren,O.(40) T5	4.15
Warren,O. R2	4.15
Weirton,W.Va. W6	4.15
Youngstown C8, Y1	4.15

STRIP, Cold-Rolled, High-Strength Low-Alloy

Cleveland A7, J5	6.20
Dover,O. G6	6.20
Ecorse,Mich. G5	6.40
Fontana,Calif. K1	6.95
Lackawanna,N.Y., B2	6.40
Sharon,Pa. S3	6.20
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.20
Weirton,W.Va. W6	6.20
Youngstown Y1	6.20

STRIP, Electro Galvanized

Weirton,W.Va. W6	4.15
Youngstown C8	4.15

Key to Producing Companies

A1	Acme Steel Co.
A3	Alan Wood Steel Co.
A4	Allegheny Ludlum Steel
A7	American Steel & Wire
A8	Anchor Drawn Steel Co.
A9	Angell Nail & Chaplet
A10	Armco Steel Corp.
A11	Atlantic Steel Co.
A13	American Cladmetals Co.
B1	Babcock & Wilcox Tube
B2	Bethlehem Steel Co.
B3	Beth. Pac. Coast Steel
B4	Blair Strip Steel Co.
B5	Bliss & Laughlin Inc.
B6	Boiardi Steel Corp.
B8	Braeburn Alloy Steel
B11	Buffalo Bolt Co.
B14	A. M. Byers Co.
C1	Calif. Cold Rolled Steel
C2	Calumet Steel Div., Borg-Warner Corp.
C3	Carnegie-Illinois Steel
C4	Carpenter Steel Co.
C5	Central Iron & Steel Div. Barium Steel Corp.
C7	Cleve.Cold.Roll.MillsCo.
C8	Cold Metal Products Co.
C9	Colonial Steel Co.
C10	Colorado Fuel & Iron
C11	Columbia Steel Co.
C12	Columbia Steel &Shaft.
C13	Columbia Tool Steel Co.
C14	Compressed Steel Shaft
C16	Continental Steel Corp.
C17	Copperweld Steel Co.
C18	Crucible Steel Co.
C19	Cumberland Steel Co.
C20	Cuyahoga Steel & Wire
D2	Detroit Steel Corp.
D3	Detroit Tube & Steel
D4	Disston & Son,Henry
D6	Driver-Harris Co.
D7	Dickson Weatherproof Nail Co.
E1	Eastern Gas&Fuel Assoc.
E2	Eastern Stainless Steel
E4	Electro Metallurgical Co.
E5	Elliott Bros. Steel Co.
E6	Empire Steel Corp.
F2	Firth Sterling Steel
F3	Fitzsimons Steel Co.
F4	Follansbee Steel Corp.
F5	Franklin Steel Div., Borg-Warner Corp.
F6	Fretz-Moon Tube Co.
G1	Geneva Steel Co.
G2	Globe Iron Co.
G3	Globe Steel Tubes Co.
G4	Granite City Steel Co.
G5	Great Lakes Steel Corp.
G6	Greer Steel Co.
H1	Hanna Furnace Corp.
H4	Heppenstall Co.
I-1	Igoe Bros. Inc.
I-2	Inland Steel Co.
I-3	Interlake Iron Corp.
I-4	Ingersoll Steel Div., Borg-Warner Corp.
J1	Jackson Iron & Steel Co.
J3	Jessop Steel Co.
J4	Johnson Steel & Wire Co.
J5	Jones & Laughlin Steel
J6	Joslyn Mfg. & Supply
J7	Judson Steel Corp.
J8	Jersey Shore Steel Co.
K1	Kaiser Steel Corp.
K2	Keokuk Electro-Metals
K3	Keystone Drawn Steel
K4	Keystone Steel & Wire
K5	Kidd Drawn Steel Co.
L1	Laclede Steel Co.
L2	LaSalle Steel Co.
L3	Latrobe Electric Steel
L5	Lockhart Iron & Steel
L6	Lone Star Steel Co.
L7	Lukens Steel Co.

UNIVERSITY OF MICHIGAN LIBRARIES

TIGHT COOPERAGE HOOP

Atlanta A11	3.40
Riverdale,Ill. A1	3.40
Sharon,Pa. S3	3.65
Youngstown C3	3.40

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	5.90
Alton,Ill.(1) L1	5.90
Bartonville,Ill.(1) K4	5.90
Buffalo W12	5.90
Cleveland A7	5.90
Donora,Pa. A7	5.90
Duluth A7	5.90
Fostoria,O. S1	5.90
Johnstown,Pa. B2	5.90
LosAngeles B3	6.85
Milbury,Mass(12) N6	6.20
Monessen,Pa. P7, P16	5.90
Palmer,Mass. W12	6.20
Pittsburg,Calif. C11	6.85
Portsmouth,O. P12	5.90
Roebling,N.J. R5	6.20
So.Chicago,Ill. R2	5.90
SparrowsPoint,Md. B2	6.00
Struthers,O. Y1	5.90
Trenton,N.J. A7	6.20
Waukegan,Ill. A7	5.90
Worcester A7,J4,T6,W12	6.20
Worcester,Mass. N6	6.20

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	5.35
Buffalo W12	5.35
Cleveland A7	5.35
Crawfordsville,Ind. M8	5.35
Dover,O. G6	5.35
Fostoria,O. S1	5.50
Kokomo,Ind. C16	5.35
FranklinPark,Ill. T6	5.70
Massillon,O. R8	5.35
Monessen,Pa. P7, P16	5.35
Pawtucket,R.I.(12) N8	5.65
Trenton,N.J. R5	5.65
Worcester A7, T6, W12	5.65

WIRE, Fine and Weaving (8-in. Coils)

Bartonville,Ill.(1) K4	8.45
Buffalo W12	8.45
Chicago W13	8.45
Cleveland A7	8.45
Crawfordsville,Ind. M8	8.45
Fostoria,O. S1	8.45
Johnstown,Pa. B2	8.45
Kokomo,Ind. C16	8.45
Monessen,Pa. P16	8.45
Palmer,Mass. W12	8.75
Portsmouth,O. P12	8.45
Roebling,N.J. R5	8.75
Waukegan,Ill. A7	8.45
Worcester,Mass. A7, T6	8.75

WIRE, Tire Bead

Monessen,Pa. P16	10.80
Roebling,N.J. R5	10.80

WIRE, Manufacturers Bright, Low-Carbon

AlabamaCity,Ala. R2	4.50
Aliquippa,Pa. J5	4.50
Atlanta A11	4.60
Alton,Ill.(1) L1	4.50
Bartonville,Ill.(1) K4	4.50
Buffalo W12	4.50
Chicago W13	4.50
Cleveland A7, C20	4.50
Crawfordsville,Ind. M8	4.60
Donora,Pa. A7	4.50
Duluth A7	4.50
Fairfield,Ala. T2	4.50
Fostoria,O.(24) S1	4.85
Houston S5	4.90
Johnstown,Pa. B2	4.50
Joliet,Ill. A7	4.50
KansasCity,Mo. S5	5.10
Kokomo,Ind. C16	4.60
LosAngeles B3	5.45
Minnequa,Colo. C10	4.75
Monessen,Pa. P7	4.50
Newark, 6-8ga. I-1	5.15
No.Tonawanda B11	4.90
Palmer,Mass. W12	4.80
Pittsburg,Calif. C11	5.45
Portsmouth,O. P12	4.50
Rankin,Pa. A7	4.50
So.Chicago,Ill. R2	4.50
SoSanFrancisco C10	5.45
SparrowsPoint,Md. B2	4.60
Sterling,Ill.(1) N15	4.50
Struthers,O. Y1	4.50
Torrance,Calif. C11	5.45
Waukegan,Ill. A7	4.50
Worcester,Mass. A7, T6	4.80

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.55
Alton,Ill.(1) L1	5.55
Buffalo W12	5.55
Cleveland A7	5.55
Donora,Pa. A7	5.55
Duluth A7	5.55
Johnstown,Pa. B2	5.55
LosAngeles B3	6.50
Monessen,Pa. P7, P16	5.55
NewHaven,Conn. A7	5.85
Palmer,Mass. W12	5.85
Pittsburg,Calif. C11	6.50
Portsmouth,O. P12	5.55
Roebling,N.J. R5	5.85
So.Chicago,Ill. R2	5.55
SparrowsPoint,Md. B2	5.65
Struthers,O. Y1	5.55
Torrance,Calif. C11	6.50
Trenton,N.J. A7	5.85
Waukegan,Ill. A7	5.55
Worcester,Mass. A7	5.85

WIRE, Galv'd ACSR for Cores

Monessen,Pa. P16	8.15
Roebling,N.J. R5	8.45
SparrowsPoint,Md. B2	8.25

WIRE, Merchant Quality (6 to 8 gage)

	An'ld	Galv.
AlabamaCity R2	5.35	5.60
Aliquippa J5	5.35	5.60
Atlanta A11	5.45	5.70
Bartonville(19) K4	5.35	5.60
Buffalo(31) W12	4.50	...
Cleveland A7	5.35	5.60
Crawfordsvil. M8	5.45	5.70
Donora A7	5.35	5.60
Duluth A7	5.35	5.60
Fairfield T2	5.35	5.60
Houston,Tex. S5	5.75	6.00
Johnstown B2	5.35	5.60
Joliet,Ill. A7	5.35	5.60
KansasCy.Mo S5	5.95	6.20
Kokomo C16	5.45	5.70
LosAngeles B3	6.30	...
Minnequa C10	5.60	5.85
Monessen P7	5.35	5.60
Palmer(31) W12	4.80	...
Pitts.,Cal. C11	6.30	6.55
Prtsmth.(18) P12	5.35	5.60
Rankin A7	5.35	5.60
So.Chicago R2	5.35	5.60
So.S.Fran. C10	6.30	6.55
SparrowsPt. B2	5.45	5.70
Sterling,Ill.(1)N15	5.35	5.60
Struthers,O. Y1	5.35	5.60
Torrance,Cal. C11	6.30	...
Worcester A7	5.65	5.90

WIRE (16 gage)	An'ld Stone	Galv. Stone
Aliquippa J5	9.80	11.30
Bartonville(1) K4	9.80	11.30
Cleveland A7	9.80	11.30
Crawfrdvil. M8	9.80	11.30
Fostoria,O. S1	9.90	11.40
Johnstown B2	9.80	11.30
Kokomo C16	9.80	11.30
Minnequa C10	10.05	11.80
Palmer,Mass. W12	9.80	11.30
Pitts.,Cal. C11	10.15	11.65
Prtsmth.(18) P12	9.80	11.30
SparrowsPt. B2	9.90	11.40
Waukegan A7	9.80	11.30

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	126
Aliquippa,Pa. J5	126
Atlanta A11	128
Bartonville,Ill. K4	126
Crawfordsville M8	128
Donora,Pa. A7	126
Duluth,Minn. A7	126
Fairfield,Ala. T2	126
Houston,Tex. S5	134
Johnstown,Pa. B2	126
Joliet,Ill. A7	126
KansasCity,Mo. S5	138
Kokomo,Ind. C16	128
Minnequa,Colo. C10	131
Monessen,Pa. P7	126
Pittsburg,Calif. C11	146
Portsmouth,O.(18) P12	126
Rankin,Pa. A7	126
So.Chicago,Ill. R2	126
So.SanFran.,Calif. C10	146
SparrowsPoint,Md. B2	128
Sterling,Ill(1) N15	126

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2	116
Duluth A7	116
Franklin,Pa. F5	116
Huntington,W.Va. W7	116
Johnstown,Pa. B2	116
Joliet,Ill. A7	116
Minnequa,Colo. C10	121
Moline,Ill. R2	112
So.Chicago R2	116
Williamsport,Pa. S19	120

WOVEN FENCE, 9-15½ Ga. Col.

AlabamaCity,Ala. R2	116
Ala.City,Ala.,17-18ga.R2	198
Aliquippa,Pa.9-14½ga.J5	116
Atlanta A11	118
Bartonville,Ill.(19) K4	116
Crawfordsville,Ind. M8	118
Donora,Pa. A7	116
Duluth A7	116
Houston,Tex. S5	124
Fairfield,Ala. T2	116
Johnstown,Pa. B2	116
Johnstn,17ga.6" B2	190
Johnstn,17ga.,4" B2	193
Joliet,Ill. A7	116
KansasCity,Mo. S5	128
Kokomo,Ind. C16	118
Minnequa,Colo. C10	121
Monessen,Pa. P7	116
Pittsburg,Calif. C11	139
Portsmouth,O.(18) P12	116
Rankin,Pa. A7	116
So.Chicago,Ill. R2	116
Sterling,Ill. N15	116

BALE TIES, Single Loop Col.

AlabamaCity,Ala. R2	113
Atlanta A11	114
Bartonville,Ill.(19) K4	113
Chicago W13	113
Crawfordsville M8	115
Donora,Pa. A7	113
Duluth A7	113
Fairfield,Ala. T2	113
Joliet,Ill. A7	113
KansasCity,Mo. S5	125
Kokomo,Ind. C16	115
Minnequa,Colo. C10	118
Pittsburg,Calif. C11	137
Portsmouth,O.(18) P12	113
So.Chicago,Ill. R2	113
So.SanFran.,Calif. C10	137
SparrowsPoint,Md. B2	115
Sterling,Ill.(1) N15	113

NAILS & STAPLES, Stock To Dealers & Mfrs. (7) Col.

AlabamaCity,Ala. R2	106
Aliquippa,Pa. J5	106
Atlanta A11	108
Bartonville,Ill.(19) K4	106
Chicago,Ill. W13	106
Cleveland A9	112
Crawfordsville,Ind. M8	108
Donora,Pa. A7	106
Duluth A7	106
Fairfield,Ala. T2	106
Galveston,Tex. D7	114
Houston,Tex. S5	114
Johnstown,Pa. B2	106
Joliet,Ill. A7	106
KansasCity,Mo. S5	118
Kokomo,Ind. C16	108
Minnequa,Colo. C10	111
Monessen,Pa. P7	106
Pittsburg,Calif. C11	125
Portsmouth,O. P12	106
Rankin,Pa. A7	106
So.Chicago,Ill. R2	106
SparrowsPoint,Md. B2	108
Sterling,Ill.(1) N15	106
Torrance,Calif. C11	126
Worcester,Mass. A7	112

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2	5.35
Bartonville,Ill.(19) K4	5.35
Crawfordsville,Ind. M8	5.45
Donora,Pa. A7	5.35
Duluth A7	5.35
Johnstown,Pa. B2	5.35
Joliet,Ill. A7	5.35
Kokomo,Ind. C16	5.45
Minnequa,Colo. C10	5.60
Pittsburg,Calif. C11	6.30
Portsmouth,O. P12	5.35
Rankin,Pa. A7	5.35
So.Chicago,Ill. R2	5.35
SparrowsPoint,Md. B2	5.45
Worcester,Mass. A7	5.65

NAILS, Cut (100 lb keg) To dealers (33)

Conshohocken,Pa. A3	$6.75
Wheeling,W.Va. W10	6.75

AXLES

Fairfield,Ala. T2	5.25
Gary,Ind. C3	5.25
Ind.Harbor,Ind. S13	5.25
Johnstown,Pa. B2	5.25
McKeesRocks,Pa. C3	5.25

TIE PLATES

Fairfield,Ala. T2	4.20
Gary,Ind. C3	4.20
Ind.Harbor,Ind. I-2	4.20
Lackawanna,N. Y. B2	4.20
Minnequa,Colo. C10	4.20
Pittsburg,Calif. C11	4.35
Pittsburgh R2	4.20
Seattle B3	4.35
Steelton,Pa. B2	4.20
Torrance,Calif. C11	4.35
Weirton,W.Va. W6	4.20

JOINT BARS

Bessemer,Pa. C3	4.40
Fairfield,Ala. T2	4.40
Ind.Harbor,Ind. I-2	4.40
Joliet,Ill. C3	4.40
Lackawanna,N.Y. B2	4.40
Minnequa,Colo. C10	4.40
Steelton,Pa. B2	4.40

TRACK BOLTS (20) Treated

Fairfield,Ala. T2	9.10
KansasCity,Mo. S5	9.10
Lebanon,Pa.(32) B2	8.85
Minnequa,Colo. C10	8.85
Pittsburgh O3, P14	9.10
Seattle B3	9.35

STANDARD TRACK SPIKES

Fairfield,Ala. T2	5.60
Ind.Harbor,Ind. I-2, Y1	5.60
KansasCity,Mo. S5	5.85
Lebanon,Pa. B2	5.60
Minnequa,Colo. C10	5.60
Pittsburgh J5	5.60
Seattle B3	6.10
So.Chicago,Ill. R2	5.60
Struthers,O. Y1	5.60
Youngstown R2	5.60

ROPE WIRE	Mild Plow	Plow	Imp. Plow
Bartonville,Ill. K4	8.05	8.05	8.30
Buffalo W12	8.05	8.05	8.30
Cleveland A7	8.05	8.05	8.30
Donora,Pa. A7	8.05	8.05	8.30
Fostoria,O. S1	8.05	8.05	8.30
Johnstown,Pa. B2	8.05	8.05	8.30
Monessen,Pa. P7, P16	8.05	8.05	8.30
NewHaven,Conn. A7	8.35	8.35	8.60
Palmer,Mass. W12	8.35	8.35	8.60
Portsmouth,O. P12	8.05	8.05	8.30
Roebling,N.J. R5	8.35	8.35	8.60
SparrowsPoint,Md. B2	8.15	8.15	8.40
Struthers,O. Y1	8.05	8.05	8.30
Trenton,N.J. A7	8.35	8.35	8.60
Waukegan,Ill. A7	8.05	8.05	8.30
Williamsport,Pa. B2	8.15	8.15	8.40
Worcester,Mass. J4, T6	8.35	8.35	8.60

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	TeeRails 60 lb Under
Bessemer,Pa. C3	3.40	3.30	3.35	3.75
Ensley,Ala. T2	3.40	3.30	...	3.75
Fairfield,Ala. T2	...	...	...	3.75
Gary,Ind. C3	3.40	3.30	3.35	...
Huntington,W.Va. W7	...	...	...	3.75
Ind.Harbor,Ind. I-2	3.40	3.30	3.35	...
Johnstown,Pa. B2	...	...	...(16)	3.75
Lackawanna B2	3.40	3.30	...	3.75
Minnequa,Colo. C10	3.40	3.30	...	4.25
Steelton,Pa. B2	3.40	3.30	...	...
Williamsport,Pa. S19	...	...	...	3.75

Key to Producing Companies

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M10 Missouri-Illinois Furnace
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Co.
N5 Nelsen Steel & Wire Co.
N6 New Eng.HighCarb.Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Co.
N14 Nrthwst. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron&Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div., EatonMfg.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango FurnaceCo.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.

U1 Ulster Iron Works
U4 Universal Cyclops Steel
V2 Vanadium Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W16 Worth Steel Co.
W18 Wyckoff Steel Co.
Y1 Youngstown Sheet&Tube

TOOL STEEL

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	21.00	18W,4Cr,3V	126.00
Extra Carbon	24.50	18W,4Cr,2V,9Co	185.50
Spec. Carbon	29.50	18W,4Cr,2V,6Co	169.50
Oil Hardening	32.00	18.25W,4.25Cr,1V,4.75Co	156.50
Cr Hot Wrk.	32.00	20.25W,4.25Cr,1.6V,12.25Co	293.50
Hi-Carbon-Cr	57.50	1.5W,4Cr,1V,8.5Mo	71.50
18W,4Cr,1V	100.00	6.4W,4.5Cr,1.9V,5Mo.	76.50
18W,4Cr,2V	113.00	6W,4Cr,3V,6Mo	97.00

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, H4, J3, L3, M9, M14, R2, S8, T7, U4, V2, V3.

(1) Chicago base. (2) Angles.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pittsburgh base.
(12) Worcester, Mass. base.
(13) 3" & wider; over ½" to under 3" 5.15c.
(14) Also wide flange beams.
(15) ½" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. base.
(22) Del. San Fran. Bay area.
(23) Angles 1"x1" to 1¼"x1¼" only.
(24) Deduct 0.35c for finer than 15 Ga.
(26) Reinforcing, mill shipments; to consumers, 4.83c; fabricated to fabricators, 4.58c.
(28) Bonderized.
(31) Not annealed.
(32) Untreated.
(33) To jobbers, deduct 20 cents.
(34) 6.70c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 Ga. & lighter; 60" & narrower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 4.40c, 0.035" and heavier.
(41) Flats.
(42) Bands.

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % —Black— A	B	C	—Galvanized— D	E	F
⅛	5.5c	0.24	36.5	34.5	35.5	8.5	9.0	7.5
¼	6.0	0.42	33.5	31.5	32.5	9.5	11.0	8.5
⅜	6.0	0.57	29.0	27.0	28.0	5.5	8.0	4.5
½	8.5	0.85	40.5	38.5	39.5	24.0	22.0	23.0
¾	11.5	1.13	43.5	41.5	42.5	28.0	26.0	27.0
1	17.0	1.68	46.0	44.0	45.0	31.0	29.0	30.0
1¼	23.0	2.28	46.5	44.5	45.5	31.5	29.5	30.5
1½	27.5	2.73	47.0	45.0	46.0	32.0	30.0	31.0
2	37.0	3.68	47.5	45.5	46.5	32.5	30.5	31.5
2½	58.5	5.82	48.0	46.0	47.0	33.0	31.0	32.0
3	76.5	7.62	48.0	46.0	47.0	33.0	31.0	32.0

Column A: Etna, Pa. N2; Monaca, Pa, P9; Sharon, Pa. M6; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 1½ percentage points lower on ⅛", 2 points lower on ¼", 3 points lower on ⅜", W10. Wheatland, Pa., 2 pts lower on ⅛" through ⅜", W9. Following make ½" and larger: Lorain, O. N3; Youngstown, plus 42% on 3½" and 4", R2; Youngstown Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 11 points lower on ½" and larger continuous weld and 31% on 3½" and 4".

Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., ½" through 3", Y-1; Alton, Ill. (Lorain, O., base) L1 quotes 2 points lower on ⅛", ¼", ⅜".

Column D: Etna, Pa. N2; Monaca, Pa. P9; Sharon, Pa. M6, quotes 4 points lower; Butler, Pa., ¼" through ⅝", F6; Benwood, W. Va., except 3½ points lower on ⅛", 2½ pts on ¼", 3 pts on ⅜", W10; Wheatland, Pa., except 2 pts lower on ⅛" through ⅜", W9. Following make ½" and larger: Lorain, N3; Youngstown, plus 26.5% on 3½" and 4", R2; Youngstown, Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 11 points lower on ½" and larger continuous weld and 15.5% on 3½" and 4".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	36.0	20.5	36.0	20.5
2½	58.5	5.82	39.0	23.5	39.0	23.5
3	76.5	7.62	39.0	23.5	39.0	23.5
3½	92.0	9.20	41.0	25.5	41.0	25.5
4	$1.09	10.89	41.0	25.5	41.0	25.5
5	1.48	14.81	41.0	25.5	41.0	25.5
6	1.92	19.18	41.0	25.5	41.0	25.5

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5; Lorain, O. N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft. inclusive.

O.D. In.	B.W. Ga.	—Seamless— H.R.	C.D.	Elec. Weld H.R.	C.D.
1	13	12.36	14.39	13.96	13.96
1¼	13	14.63	17.05	14.19	16.54
1½	13	16.17	19.02	15.68	18.45
1¾	13	18.39	21.64	17.84	20.99
2	13	20.61	24.24	19.99	23.51
2¼	13	22.96	27.03	22.27	26.22
2½	12	25.29	29.76	24.53	28.87
2¾	12	27.71	32.58	26.88	31.60
3	12	29.36	34.53	28.48	33.49
3¼	12	30.82	36.27	29.90	35.18
3½	11	35.87	42.22	34.79	40.95
4	11	38.52	45.35	37.36	43.99
4½	10	47.82	56.25	46.39	54.56
5	9	63.37	74.59	61.47	72.35
6	9	73.37	86.32	71.17	83.73
	7	112.62	132.51	....	....

Boiler tube producers include Babcock & Wilcox Tube Co., National Tube Co., Globe Steel Tubes Co., Pittsburgh Steel Co., Republic Steel Corp., Standard Tube Co.

CLAD STEELS

(Cents per pound)

Cladding Stainless	—Plates— Carbon Base 10%	20%	—Strip— Cold-Rolled Carbon Base 10% Both Sides	—Sheets— Carbon Base 10%	20%	Copper Base Both Sides
302	....	....	....	....	21.50–22.50	75.00
304	22.50	26.50	....	20.75	22.50–24.00	77.00
305	....	....	....	....	....	79.00
309	27.00	31.00	....	....	....	....
310	32.50	36.50	....	....	....	105.00
316	27.00	31.00	....	26.00	28.00–32.00	....
317	30.50	34.50	....	....	....	....
318	29.50	33.50	....	....	....	....
321	23.50	27.50	....	23.00	25.00	90.00
347	25.00	29.00	....	24.00	26.00–30.00	94.00
405	18.75	24.75	....	....	....	....
410	18.25	24.25	....	....	....	....
430	18.25	24.25	....	....	....	....
Nickel	27.50	34.50	31.50	41.00	....	88.00
Inconel	36.00	46.00	....	....	....	115.00
Monel	29.00	37.00	26.50	33.50	....	83.00
Copper*	....	....	20.35†	24.95‡	....	....

* Deoxidized. † 16.85c for hot-rolled. ‡ 21.70c for hot-rolled. Production points for carbon base products: Stainless plates, sheets, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. W16 and Coatesville L7; nickel, inconel, monel-clad plates, Coatesville L7; nickel, monel, copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:
- ½-in. & smaller diam.. 27
- ⅝-in. & ⅞-in. 29
- ¾-in. and larger 26

Longer than 6 in.:
- All diams. 22

Lag bolts, all diams.:
- 6 in. and shorter 30
- over 6 in. long 28

Ribbed Necked Carriage. 26
Blank 40
Plow 40
Step, Elevator, Tap, and Sleigh Shoe 28
Tire bolts 20
Boiler & Fitting-Up bolts 37

NUTS

H.P. & C.P. Reg. & Heavy Square:
- ½-in. and smaller 25
- ⅝-in. & ⅞-in. 23
- 1-in.-1½-in. 23
- 1⅝ in. and larger 16

H.P. Hex.:	Reg.	Heavy
½-in. & smaller	33	29
⅝-in. & ⅞-in..	28	25
1-in.-1½-in. ..	25	23
1⅝ in. & larger	17	16

C.P. Hex.:		
½-in. & smaller	33	29
⅝-in. & ⅞-in..	30	27
1-in. & 1½ in.	27	24
1⅝ in. & larger	20	17

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

½-in. and smaller	Hvy.	Reg.	Lght.
	35	41	41
⅝-in. & ⅞-in.	30	36	36
1-in.-1½ in..	27	31	33
1⅝-in.&larger	17	21	..

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish ..... 63.5 & 10
Plated finishes ... 50 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:
- ¼-in. through ⅝-in. .. 50
- ¾-in. through 1 in. .. 43

Longer than 6 in.:
- ¼-in. through ⅝-in.... 33
- ¾-in. through 1 in.... 13

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter 46
1 in. and smaller diam. x over 6 in. 33

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller 41
¼-in. diam. & larger 24
N.F. thread, all diams. . 18

RIVETS

F.o.b. midwestern plants
Structural ½-in., larger 7.25c
⅜-in., under .....43 off

Washers, Wrought

F.o.b. shipping point, to jobbers .....Net to $1 off

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

Inches Diam.	Length	Cents per lb
17,18,20	60,72	16.00
8 to 16	48,60,72	16.50
7	48,60	17.75
6	48,60	19.00
4, 5½	40	19.50
3	40	20.50
2½	24,30	21.00
2	24,30	23.00

CARBON

40	100,110	7.50
35	100,110	7.50
30	84,110	7.50
24	72 to 104	7.50
17 to 20	34,90	7.50
14	60,72	8.00
10,12	60	8.25

STAINLESS STEEL

(Cents per pound)

Type	Sheets	C.R. Strip	Bars Wire Structurals
301...	37.50	30.50	28.50
302...	37.50	33.00	28.50
303...	39.50	36.50	31.00
304...	39.50	35.00	30.00
309...	52.00	52.00	41.50
316...	53.00	55.00	46.00
321...	45.50	44.50	34.00
347...	50.00	48.50	38.50
410...	33.00	27.00	23.00
416...	33.50	33.50	23.50
420...	40.50	43.50	28.50
430...	35.50	27.50	23.50
501...	24.00	22.50	11.50
502...	25.00	23.50	12.50

Baltimore, Type 301 through 347 sheet, except 309 E2.
Baltimore, bars wire and structurals A10.
Brackenridge,Pa., sheets A4
Bridgeville, Pa., bars, wire, sheets & strip, except Type 309 strip quoted 51.00c U4.
Butler,Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502 A10.
Carnegie, Pa., strip except Type 416; Type 309 strip quoted 51.00c. S18.
Cleveland, strip, except Type 309 quoted 51.00c and except Type 416 A7.
Detroit, strip, except Type 309 M1.
Dunkirk,N.Y. bars, wire A4.
Duquesne, Pa., bars C3.
Fort Wayne, Ind., bars and wire, except Types 501 and 502 J6.
Gary, Ind., sheets except Type 416 C3.
Harrison, N. J., strip C18.
Harrison, N. J., Types 302, 304, 316 wire and strip D6.
Massillon, al: products, except Type 309 bars, wire & structurals quoted 42.00c. Type 501, 10.50c, Type 502 11.50c R2.
McKeesport, Pa., bars; sheets except Type 416, C3.
McKeesport, Pa., bars & wire except Types 301, 309, 501 & 502; strip Types 410 & 430 only F2.
Middletown, O., sheets and strip, except Types 303, 416, 420, 501 and 502 A10.
Midland, sheets & strip C18.
Munhall, Pa., bars C3.
Pittsburgh, sheets C18.
Reading, Pa., bars & strip except Type 309 bars quoted 41.00c C4.
So. Chicago, Ill., bars & structurals C3.
Syracuse, N. Y., bars, wire & structurals C18.
Titusville, Pa., bars U4.
Wallingford, Conn., strip, except 309, W2 quotes ¼-cent higher.
Washington, Pa., bars, sheets & strip except Type 309 strip quoted 51.00c J3.
Washington, Pa., Types 301 through 347 sheets & strip as listed except 303 & 309; 316 sheets 58.00c, strip 60.00c W4.
Watervliet, N. Y., structurals & bars A4.
Waukegan, bars & wire A7.
West Leechburg, Pa., strip, except Type 300 quoted 51.00c A4.
Youngstown, strip C8.

COAL, CHEMICALS

Spot, cents per gallon, ovens
Pure benzol 25.00
Tuluol, one deg...18.25-25.75
Industrial xylol ..19.75-27.50

Per ton bulk, ovens

Sulphate of ammonia.$32-45

Cents per pound, ovens

Phenol, 40 (carlots, returnable drums) 13.50
Do., less than carlots..14.25
Do., tank cars 12.50

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $37; less than 60%, $34.
Imported, net ton, duty paid, metallurgical grade, $39-40.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

	Cents
Sponge Iron:	
98+% Fe, carlots..	15.00
Swedish, c.l.f. New York, in bags...	7.40-8.50
Electrolytic Iron:	
Annealed, 99.5% Fe	39.50
Unannealed, 99+% Fe	33.50
Unannealed 99+% Fe (minus 325 mesh)	48.50
Carbonyl Iron:	
97.9-99.8%, size 5 to 10 microns..70.00-135.00	
Aluminum:	
Carlots, freight allowed	27.00
Atomized, 500 lb drums, freight allowed	30.00
Brass, 10-ton lots.	27.25-29.25
Copper:	
Electrolytic	28.75-31.50
Reduced	29.00
Lead	18.50
Manganese:	
Minus 100-mesh	52.00-55.00
Minus 35 mesh	48.00
Minus 200 mesh	56.00
Nickel unannealed ..	66.00
Nickel-Silver, 10-ton lots	36.25
Silicon	34.00-40.00
Solder (plus cost of metal)	8.50
Stainless Steel, 302...	75.00
Tin	90.50
Zinc, 10-ton lots..	18.00-25.50
	Dollars
Tungsten:	
99%, minus 80 to 200 mesh, freight allowed, over 1000 lb	2.90
1000 lb	2.95
less than 1000 lb..	3.00
98.8%, minus 65 mesh, freight allowed, 1000 lb and over..	2.90
less than 1000 lb. .	3.00
Molybdenum:	
99%, minus 80 to 200 mesh, over 500 lb	2.25
200 to 500 lb	2.60
less than 200 lb..	2.75
82-88%, freight allowed, 2000 lb and over..	2.40
less than 2000 lb..	2.45
Chromium, electrolytic 99% Cr min.	3.50

METALLURGICAL COKE

Price per net ton

BEEHIVE OVENS

Connellsvll,fur. .$14.00-14.50
Connellsvll,fdry. .15.00-16.00
New River, foundry...19.00
Wise county, foundry..15.95
Wise county, furnace..15.20

OVEN FOUNDRY COKE

Kearney, N. J., ovens.$22.00
Everett, Mass., ovens
New England, del.‡ 23.40
Chicago, ovens 21.00
Chicago del. .....†22.45
Detroit, del. 24.91
Terre Haute, ovens....21.20
Milwaukee, ovens 21.75
Indianapolis, ovens 20.75
Chicago, del. 24.12
Cincinnati, del. 23.67
Detroit, del. 24.65
Ironton, O., ovens. 20.40
Cincinnati, del. 22.71
Painesville, O., ovens .21.90
Buffalo, del. 24.02
Cleveland, del. 23.62
Erie, del. 22.04
Birmingham, ovens 19.15
Birmingham, del. 20.20
Philadelphia, ovens ...21.25
Neville Island,Pa.,ovens 21.00
Swedeland, Pa. ovens.21.20
Portsmouth, O., ovens.20.15
Cincinnati, del. 22.71
Detroit, ovens 21.65
Detroit, del. 22.65
Buffalo, del 24.00
Flint, del. 24.09
Pontiac, del. 23.04
Saginaw, del. 24.40

Includes representative switching charge of: *, $1.05; †, $1.45, one-track charge being $1.20, two tracks $1.40, and three or more tracks $1.50. ‡ Or within $4.15 freight zone from works.

UNIVERSITY OF MICHIGAN LIBRARIES

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Galv. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140‡		Carbon	Floor
New York (city)	5.75	6.84	7.40	6.04	...	5.95	6.64	8.60	5.85	6.10	7.54
New York(c'try)	5.55	6.64	7.20	5.84	...	5.75	6.44	8.40	5.65	5.90	7.34
Boston (city) ..	5.95	6.75	7.37	5.90	...	5.80	6.39	8.70	5.95	6.28	7.48
Boston (c'try) .	5.75	6.55	7.17	5.70	...	5.60	6.19	8.50	5.75	6.08	7.28
Phila. (city) ..	6.45	6.60	7.10	5.90	...	5.75	6.46	8.40	5.50	5.70	6.80
Phila. (c'try)..	6.20	6.35	6.85	5.65	...	5.50	6.21	8.15	5.25	5.45	6.55
Balt. (city) ...	5.35	6.59	6.66	5.79	...	5.79	6.39	...	5.89	5.60	7.24
Balt. (c'try) ..	5.15	6.39	6.46	5.59	...	5.59	6.19	...	5.69	5.40	7.04
Norfolk, Va. ..	6.10	...	...	6.30	...	6.15	7.20	...	6.20	6.15	7.55
Richmond, Va..	5.35	...	6.90	5.63	...	5.53	6.30	...	5.63	5.45	7.13
Wash. (w'hse).	5.56	6.80	6.73	6.00	...	6.00	6.62	...	6.10	5.81	7.45
Buffalo (del.)..	5.35	6.15	7.10	5.61	...	5.35	5.95	10.10††§	5.55	5.85	7.15
Buffalo (w'hse).	5.15	5.95	6.90	5.41	...	5.15	5.75	9.90††§	5.35	5.65	6.95
Pitts.(w'hse) ..	5.15	5.95*	6.60-6.70	5.20	6.15	5.10	5.75	9.55††	5.25	5.35	6.60
Detroit (w'hse).	5.33	6.08*	7.09	5.49	...	5.39	5.91	9.86††§	5.64	5.79	6.88
Cleveland (del.)	5.35	6.15	7.50	5.44	6.35	5.32	5.95	8.31	5.57	5.72	6.92
Cleve. (w'hse) .	5.15	5.95	7.30	5.24	6.15	5.12	5.75	8.16	5.37	5.52	6.72
Cincin. (city)..	5.57	6.14	6.54	5.50	...	5.50	6.11	...	5.79	5.94	7.10
Chicago (city) .	5.35	6.15	7.05	5.30	...	5.30	5.85	9.75††§	5.45	5.60	6.80
Chicago (w'hse)	5.15	5.95	6.85	5.10	...	5.10	5.65	9.55††§	5.25	5.40	6.60
Milwaukee(city)	5.49	6.29	6.94	5.44	...	5.44	6.09	9.89††§	5.59	5.74	6.94
Milwau. (c'try).	5.29	6.09	7.14	5.24	...	5.24	5.89	9.69††§	5.39	5.54	6.74
St. Louis (del.).	5.68	6.48	7.28	5.63	...	5.63	6.28	10.08††§	5.78	5.93	7.13
St. L. (w'hse).	5.48	6.28	7.08	5.43	...	5.43	6.08	9.88††§	5.58	5.73	6.93
Kans. City(city)	5.95	6.75	7.60	5.90	...	5.90	6.55	...	6.05	6.20	7.60
KansCity(w'hse)	5.75	6.55	7.40	5.70	...	5.70	6.35	...	5.85	6.00	7.40
Omaha, Nebr. .	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Birm'ham (del.)	5.30	6.10	6.30[3]	5.25	...	5.25	6.88	...	5.40	5.55	7.83
Birm'hm(w'hse)	5.15	5.95	6.15[3]	5.10	...	5.10	...	...	5.25	5.40	...
Los Ang. (city)	6.10	7.65	7.70[3]	6.15	8.30	6.00	7.75	...	6.10	6.00	8.40
L. A. (w'hse)..	5.90	7.45	7.50[3]	5.95	8.10	5.80	7.55	...	5.90	5.80	8.20
San Francisco .	6.25[9]	7.60[3]	7.50[3]	6.75[9]	8.25[3]	6.15[9]	7.55	...	6.00[9]	6.15[9]	8.10[9]
Seattle-Tacoma.	6.60	8.15[3]	...	6.85	...	6.35	8.50	10.10	6.20	6.35[7]	8.40[7]

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [3]—500 to 1499 lb; [5]—450 to 1499 lb; [6]—1000 to 1999 lb; [7]—300 to 999 lb; [9]—400 to 9999 lb.

REFRACTORIES

(Prices per 1000 bricks, f.o.b. plant)

FIRE CLAY BRICK

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., Ottawa, Ill., $106. Hard-fired, $142 at above points.

High-Heat Duty: Salina, Pa. $91; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., $86.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $80.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Bessemer, Ala., $72; Ottawa, Ill., $70.

LADLE BRICK

Dry Press: Freeport, Merill Station, Clearfield, Pa., Irondale, Wellsville, O., Chester, W. Va., New Cumberland, W. Va., $60.

Wire Cut: Chester, W. Va., Wellsville, O., New Cumberland, W. Va., $58.

MALLEABLE BUNG BRICK

St. Louis, Mo., Olive Hill, Ky., $96; Ottawa, Ill., $90; Beach Creek, Pa., $86.

SILICA BRICK

Mt. Union, Claysburg, or Sproul, Pa., Portsmouth, O., Ensley, Ala., $86; Hays, Pa., $91; Joliet or Rockdale, Ill., E. Chicago, Ind., $95; Lehi, Utah, Los Angeles, $101.

Eastern Silica Coke Oven Shapes (net ton): Claysburg, Mt. Union, Sproul, Pa., Birmingham, $84.

Illinois Silica Coke Oven Shapes (net ton): Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $85.

BASIC BRICK

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Burned chrome brick, $66; chemical-bonded chrome brick, $69; magnesite brick, $91; chemical-bonded magnesite, $80.

MAGNESITE

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)

Domestic dead - burned, ⅝" grains; bulk, $33; single paper bags, $38.

DOLOMITE

(Base prices per net ton)

Domestic, dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Narlo, Millersville, Martin, Gibsonburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Bonne Terre, Mo., $12.45.

ORES

LAKE SUPERIOR IRON ORE

Gross ton, 51½% (natural), lower lake ports. After Jan. 25, 1950, increases or decreases, if any, in upper lake rail freight, dock handling charges and taxes thereon are for buyer's account.

Old range bessemer	$8.10
Old range nonbessemer	7.95
Mesabi bessemer	7.85
Mesabi nonbessemer	7.70
High phosphorus	7.70

EASTERN LOCAL ORE

Cents per unit, del E. Pa.

Foundry and basic 56.62% concentrates contract	16.00

FOREIGN ORE

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hematites	15.75
Brazilian iron ore, 68-69%	18.00

TUNGSTEN ORE

Wolframite, scheelite, net ton unit, duty paid	$20-22

MANGANESE ORE

Long term contracts, nominal; nearby, 48%, duty paid, 79.8c-81.8c per long ton unit, c.i.f. U. S. ports; prices on lower grades adjusted to manganese content and impurities.

CHROME ORE

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$32.50
48% 3:1	35.00-36.00
48% no ratio	26.00

South African Transvaal

44% no ratio	$17.00-18.00
45% no ratio	17.30-18.30
48% no ratio	26.00
50% no ratio	27.00-27.50

Brazilian

44% 2.5:1 lump	$32.00

Rhodesian

45% no ratio	$20.00-21.00
48% no ratio	26.00
48% 3:1 lump	35.00-36.00

Domestic—rail nearest seller

48% 3:1	$39.00

MOLYBDENUM

Sulphide concentrates per lb, molybdenum content, mines	$0.90

FERROALLOYS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si), Carlot per gross ton, $65, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $172 per gross ton of alloy, cl., packed, $184; gross ton lots, packed, $199; less gross ton lot, packed, $216; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: $174, f.o.b. Birmingham and Johnstown, Pa., furnaces; $172, Sheridan, Pa.; $175, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $214; less gross ton lots, $231 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices. 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal, 2" x D (Mn 96% min., Fe 2% max., Si 1% max., C 0.2% max.): Carload lump bulk, 29c per lb of metal; packed, 35.5c; ton lot 31.25c, less ton lot 33.25c. Delivered. Spot, add 2c.

Manganese, Electrolytic: Less than 250 lb, 35c; 250 lb to 1999 lb, 32c; 2000 to 39,999 lb, 30c; 40,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 20.5c per lb of contained Cr. c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered: Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

(*Please turn to page* 158)

Heavy Zinc Demand To Continue

Purchasing agents are told they are justified in anticipating requirements over next 60 to 90 days. Prices rise ½-cent to 15-cent basis. Large Mexican mine closed by strike

New York—Demand for zinc should continue at high levels, and buyers are justified in maintaining working inventories and anticipating requirements over the next 60 to 90 days. This opinion was expressed at the nonferrous metals forum held in conjunction with the international convention of the National Association of Purchasing Agents held in Cleveland last week.

Increased demand, plus stockpiling, account for the advance in zinc prices to the present 15-cent level. In May, shipments amounted to 90,346 tons compared with production of only 79,645 tons. Domestic consumers took 72,806 tons; export and drawback, 209 tons; the government, 17,331 tons. Stocks at the end of May totaled only 41,819 tons while unfilled orders on smelters' books total 66,430 tons.

Supplies from abroad are expected to be smaller because of increased demand from countries other than the United States. The supply situation is further aggravated by prospects of a reduction in imports of Mexican metal. The American Smelting & Refining Co.'s large Rosita smelter in that country was closed by a strike June 12.

Advance of ½-cent in the price of zinc to the basis of 15.00c, E. St. Louis, followed a $4 boost in the price of zinc concentrates at Joplin, Mo. Producers generally are sold out for June and July, but moderate tonnages earmarked for regular customers are being sold on the new price basis.

Copper Price Tone Strong

New York—Undertone of the copper market continues strong, as indicated by the advance in custom smelters' buying prices for red metal scrap. At current levels, custom smelters would just about break even on the sale of refined copper at 22.50c.

Refined copper supplies remain tight, being aggravated by the strike at Anaconda Copper Mining Co.'s large Chuquicamata mine in Chile. This strike, if prolonged, will have a serious effect on the domestic market since large imports are necessary to supplement the inadequate domestic supplies.

Interests fighting for extension of the existing suspension of the import tax on copper stress need for large imports. Unless Congress passes a new law, a $40 per ton import duty on copper will become effective July 1. The administration seeks a two-year extension of the present tariff suspension, but the western bloc of legislators is balking.

At the end of May, refined copper stocks totaled only 51,020 tons. They were equivalent to less than two weeks' supply and were 6008 tons less than the 57,028 tons held at end of April. Stocks are smallest since October, 1944, when they totaled 49,358 tons. At that time, however, Reconstruction Finance Corp. held substantial tonnages that were parcelled out by that agency for wartime and civilian use. For a comparable peacetime period, the present producer supply is the lowest since April, 1937, when stocks totaled 46,118 tons.

With the copper supply tight, deliveries of refined metal to domestic consumers totaled 113,837 tons in May, an increase of 12,108 tons over April shipments of 101,729 tons. In addition, there were substantial tonnages of copper shipped to the government for its emergency stockpile. Although figures on stockpile acquisitions are not available, it is estimated that their inclusion would lift May deliveries to about 140,000 tons of copper and those for April to about 123,000 tons.

American refineries produced 112,388 tons of refined copper during May compared with 103,293 tons in April, a gain of 9095 tons.

A Guillotine over Copper Imports

As Seen by
Revere Copper & Brass Inc.

Tin Mining Hampered

New York—If the large rate of consumption is maintained for the balance of the year, total consumption in 1950 should be in excess of 60,000 tons as against 65,000 tons in 1948 and 50,300 tons in 1949. This forecast was made by a speaker on the nonferrous metals forum at the annual international convention of the National Association of Purchasing Agents in Cleveland. Tin consumers were warned that political unrest in the Far East constitutes a serious threat to future supplies. Very little exploratory work is being done in Malaya and production is catching up rapidly on development work previously done. Consumers here will feel the effect of this in one to one and one-half years; the effect is bound to become more serious.

No excess tin will be on the market during the next two years at least, because the government will absorb in 1950-51 any tonnage not required by industrial users.

Approves Tin Smelter Bill

Washington—Bill to extend through June 30, 1956, the government's authority to operate the Texas City, Tex., tin smelter is approved by the House Banking Committee. Officials of the Reconstruction Finance Corp. believe the present authority to run this plant, the only major smelter in the western hemisphere, should be changed well in advance of its expiration date, June 30, 1951. Extension for a long period would enable the government to negotiate more advantageously for tin ore contracts. It is also deemed necessary to insure the objectives of the government's stockpiling program.

The House committee wrote into the bill a new provision proposed by Vulcan Detinning Co., Sewaren, N. J. This would direct RFC to operate the smelter "with due regard to the public interest in the maintenance of domestic smelting of western hemisphere tin ores and concentrates by American private enterprise."

Curtails Lead Stockpiling

Washington—Munitions Board informed its Nonferrous Metals Industry Advisory Committee on Tuesday that the stockpile objective for lead has been substantially reduced and that buying will be curtailed beginning July 1. The Committee pointed out that lead is now in long supply and asked the Board to give consideration to some means of tapering off buying gradually instead of dropping it suddenly.

The Board reported buying of zinc for the stockpile will continue at its present rate. The Committee pointed out that zinc is in short supply and will be even shorter in the next few months so that stockpile purchases should be spread out to minimize effects on the market.

Fears Copper Duty

Rome, N. Y.—Apprehension over the possibility of a 2-cent a pound import duty being imposed on copper imports was expressed last week by H. T. Dyett, chairman, Rome Cable Corp. He told stockholders:

"Congress is considering action on the 2-cent import tariff on copper. Should this go into effect, it would mean that all imported copper would be subject to this 2-cent advance. Copper prices have recently gone up sharply and the domestic price now is 22.50c a pound. We are hopeful that Congress will not permit this 2-cent import duty to go into effect as it dangerously adds to the upward inflationary spiral in the cost of an important metal product."

UNIVERSITY OF MICHIGAN LIBRARIES

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 22.50c, Conn. Valley; Lake 22.62½c, Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 21.75-22.00c; 88-10-2 (No. 215) 29.00c; 80-10-10 (No. 305) 25.50c; No. 1 yellow (No. 405) 18.25-19.00c.

Zinc: Prime western 15.00c; brass special 15.25c; intermediate 15.50c, East St. Louis; high grade 16.10c, delivered.

Lead: Common 11.80c; chemical 11.90c; corroding 11.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 17.50c, pigs 16.50c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 18.25-18.75c; No. 12 foundry alloy (No. 2 grade) 17.75-18.00c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 18.75c; grade 2, 18.00c; grade 3, 17.25c; grade 4, 16.75c. Prices include freight at carload rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 21.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt, June and July del 77.50c; Aug. del. 77.37½c.

Antimony: American 99-99.8% and over but not meeting specifications below 24.50c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 25.00c; f.o.b. Laredo, Tex., for bulk shipments. Foreign, 99%: Chinese and Yugoslavian, 22.00c; English and Belgian, prompt, 23.00c, New York.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 48.00c; 25-lb pigs, 50.50c; "XX" nickel shot, 51.50c; "F" nickel shot or ingots, for addition to cast iron, 48.50c. Prices include import duty.

Mercury: Open market, spot, New York $70-$73 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $24.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $2.15 del.; special or patented shapes, $2.30.

Cobalt: 97-99%, $1.80 per lb for 550 lb (keg); $1.80 per lb for 100 lb (case); $1.87 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 72.75c per oz.

Platinum: $66-$69 per ounce.

Palladium: $24 per troy ounce.

Iridium: $100 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill; based on 22.50-cent copper.)

Sheet: Copper 37.43; yellow brass 34.19; commercial bronze, 95%, 37.38; 90%, 36.93; red brass, 85% 35.96; 80%, 35.52; best quality, 35.04; nickel silver, 18%, 48.39; phosphor-bronze, grade A, 5% 55.11.

Rods: Copper, hot-rolled 33.28; cold-drawn 34.53; yellow brass free cutting, 28.54; commercial bronze, 95% 37.07; 90% 36.62; red brass 85% 35.65; 80% 35.21.

Seamless Tubing: Copper 37.47; yellow brass 37.20; commercial bronze 90% 39.59; red brass 85% 38.87; 80% 38.43.

Wire: Yellow brass 34.48; commercial bronze, 95% 37.67; 90% 37.22; red brass, 85% 36.25; 80% 35.81; best quality brass 35.33.

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 26.67, l.c.l. 27.17, 100,000 lb lots 26.545; weatherproof, f.o.b. eastern mills, c.l. 28.10, l.c.l. 28.60, 100,000 lb lots 27.85; magnet, del., 15,000 lb or more 32.50, l.c.l. 33.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders.)

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	27.4	...	...
0.135-0.096	12-48	27.9	...	...
0.095-0.077	12-48	28.4	26.5	30.1
0.076-0.061	12-48	29.0	26.7	30.3
0.060-0.048	12-48	29.2	26.9	30.6
0.047-0.038	12-48	29.6	27.1	30.9
0.037-0.030	12-48	30.0	27.5	31.4
0.029-0.024	12-48	30.4	27.8	31.8
0.023-0.019	12-36	31.0	28.2	32.3
0.018-0.017	12-36	31.6	28.8	33.1
0.016-0.015	12-36	32.3	29.4	34.0
0.014	12-24	33.2	30.2	35.1
0.013-0.012	12-24	34.1	30.9	36.0
0.011	12-24	35.1	31.8	37.2
0.010-0.0095	12-24	36.1	32.8	38.5
0.009-0.0085	12-24	37.3	33.9	40.0
0.008-0.0075	12-24	38.6	35.1	41.6
0.007	12-18	40.0	36.4	43.4
0.006	12-18	41.5	37.7	47.5

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	R317-T4	—Hexagonal— 17S-T4
0.125	48.5	....	....
0.156-0.203	41.5	....	....
0.219-0.313	38.5	....	....
0.344	37.5	....	47.5
0.375	37.0	46.0	44.5
0.406	37.0	....	....
0.438	37.0	46.0	44.5
0.469	37.0	....	....
0.500	37.0	46.0	44.5
0.531	37.0	....	....
0.563	37.0	....	42.0
0.594	37.0	....	....
0.625	37.0	43.5	42.0
0.656	37.0	....	....
0.688	37.0	....	42.0
0.750-1.000	36.0	41.0	39.5
1.063	36.0	....	38.0
1.125-1.500	35.0	39.5	38.0
1.563	35.0	....	37.0
1.625	34.0	....	37.0
1.688-2.000	34.0	....	....
2.125-2.500	33.0	....	....
2.625-3.375	32.0	....	....

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, $17.00 per cwt; add 50c cwt, 10 sq ft to 140 sq ft. Pipe: Full coils, $17.00 per cwt. Traps and bends: List price plus 45%.

ZINC

Sheets, 20.75c, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 20.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 19.00c; over 12-in., 20.00c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 69.00c. Strip, cold-rolled, 75.00c. Rods and shapes, 65.00c. Plates, 67.00c. Seamless tubes, 98.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 53.00c. Strip, cold-rolled, 56.00c. Rods and shapes, 51.00c. Plates, 52.00c. Seamless tubes, 86.00c. Shot and blocks, 46.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb. 55.00-57.50c; 25 to 99 lb. 45.00-47.50c; 100 lb to 5000 lb, 37.50-38.00c.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 25.50c; 5 tons and over 26.00c; 1 to 5 tons, 26.50c; less than 1 ton 27.00c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed; Flat untrimmed 34.09c; oval 33.59; cast 32.12c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 1000 lb 46.50c, under 1000 lb 48.50c f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,000 lb, 17.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 26.25c; over 250 lb, 25.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 100 lb, 64.00c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 26.50c; 400-lb bbl. 24.50c, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over 94.00c, 500 to 999 lb, 94.5c; 200 to 499 lb, 95.00c; less than 200 lb, 96.5c, ball, 1000 lb and over, 96.25c; 500 to 999 lb, 96.75c; 200 to 499 lb 97.25c; less than 200 lb, 98.75c, f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 59.7c, 100 or 300 lb drums only, 100 to 500 lb, 51.4c; 600 to 1900 lb, 49c; 2000 to 9900 lb, 47.3c, f.o.b. Sewaren, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100 lb drums, less than 10 drums 42.00c, 10 or more drums 40.00c, f.o.b. Niagara Falls, N. Y.; 43.25c and 41.25c, respectively, del. Cleveland or Philadelphia.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb 85.70; more than 2000 lb, 83.70c, f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, 72.29c; 100 lb kegs 73.29c, f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb, f.o.b. shipping point.

	Heavy Clean	Ends Rod	Turnings Clean
Copper	19.50	19.50	18.75
Yellow Brass	16.75	16.50	15.50
Commercial Bronze			
95%	18.50	18.25	17.75
90%	18.375	18.125	17.625
Red brass			
85%	18.125	17.875	17.375
80%	17.875	17.625	17.125
Best Quality (71-80%)	17.50	17.25	....
Muntz metal	15.75	15.50	15.00
Nickel, silver, 10%	19.12½	18.87½	9.56¼
Phos. bronze, A	19.75	19.50	18.50
Naval brass	16.12½	15.87½	15.37½
Manganese bronze	16.12½	15.87½	15.25

BRASS INGOT MAKERS' BUYING PRICES

(Cents per pound, delivered eastern refineries, carload lots)

No. 1 copper 19.25; No. 2 copper 18.25; light copper 17.25; composition red brass 16.50; radiators 13.50; heavy yellow brass 12.50.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 19.25; No. 2 copper 18.25; light copper 17.25; refinery brass (60% copper) per dry copper content 17.50.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 17.25-17.50; No. 2 16.25-16.50; light copper 15.25-15.50; No. 1 composition red brass 14.75-15.00; No. 1 composition turnings 14.25-14.50; mixed brass turnings 9.25-9.50; new brass clippings 15.00-15.25; No. 1 brass rod turnings 13.25-13.50; light brass 9.25-9.50; heavy yellow brass 10.00-10.25; new brass rod ends 13.50-13.75; auto radiators, unsweated 11.50-11.75; cocks and faucets, 13.00-13.25; brass pipe 13.25-13.50.

Lead: Heavy 9.50-9.75; battery plates 5.25-5.50; linotype and stereotype 11.50-11.75; electrotype 9.75-10.00; mixed babbitt 9.75-10.00.

Zinc: Old zinc 7.75-8.00; new die cast scrap 8.00-8.25; old die cast scrap 5.25-5.50.

Tin: No. 1 pewter 39.00-41.00; block tin pipe 60.00-62.00; No. 1 babbitt 30.00-32.00.

Aluminum: Clippings 2S 11.50-12.00; old sheets 8.50-9.00; crankcase 8.50-9.00; borings and turnings 5.50.

DAILY PRICE RECORD

1950	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
June 15	22.50	11.80	15.00	77.50	17.50	24.50	48.00	72.75
June 14	22.50	11.80	15.00	78.00	17.50	24.50	48.00	72.75
June 13	22.50	11.80	15.00	77.625	17.50	24.50	48.00	72.75
June 12	22.50	11.80	15.00	77.75	17.50	24.50	48.00	72.75
June 9-10	22.50	11.80	14.50	78.25	17.50	24.50	48.00	72.75
June 7-8	22.50	11.80	14.50	78.375	17.50	24.50	48.00	72.75
June 6	22.50	11.80	14.50	78.00	17.50	24.50	48.00	72.75
June 5	20.50-22.50	11.80	14.50	78.00	17.50	24.50	48.00	72.75
June 2-3	20.50	11.80	14.50	78.125	17.50	24.50	48.00	72.75
June 1	20.50	11.80	13.00	77.875	17.50	24.50	48.00	72.75
May Avg.	19.962	11.521	11.990	77.500	17.192	24.50	40.308	72.635
May 31	20.50	11.80	13.00	78.00	17.50	24.50	48.00	72.75
May 29	20.50	11.80	13.00	78.125	17.50	24.50	40.00	72.75
May 26-27	20.50	11.80	12.50	78.00	17.50	24.50	40.00	72.75

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

IRON AND STEEL SCRAP

Consumer prices, except as otherwise noted, including brokers' commissions, as reported to STEEL, June 15, 1950; gross tons except as noted. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

June 15	$39.33
June 8	40.83
May 1950	33.82
June 1949	20.85
June 1945	19.07

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 Heavy Melt.	*$45.00*
No. 2 Heavy Melt.	39.00*
No. 1 Busheling	*45.00*
No. 1 Bundles	46.00-48.00*
No. 2 Bundles	*36.00*
Heavy Turnings	36.00-37.00
Machine Shop Turnings	30.00-31.00†
Mixed Borings, Turnings	30.00-31.00†
Short Shovel Turnings	33.50-34.50
Cast Iron Borings	29.50-30.50
Low Phos. Steel	46.50-47.00

Cast Iron Grades

No. 1 Cupola Cast	**37.00-38.00**
No. 1 Machinery Cast	**41.00-42.00**
Charging Box Cast	**37.00-38.00**
Heavy Breakable Cast	**33.50-34.50**

Railroad Scrap*

No. 1 R.R. Heavy Melt.	47.00
Rails, Random Lengths	45.00-46.00
Rails, 2 ft. and under	46.50-47.00
Rails, 18 in. and under	47.50-48.50
Railroad Specialties	50.00-51.00
Axles	45.00-46.00
Angles, Splice Bars	46.00-47.00

* Nominal.
† Crushers' buying prices.

CLEVELAND

No. 1 Heavy Melt. Steel	*$41.50-42.00*
No. 2 Heavy Melt. Steel	*36.50-37.00*
No. 1 Busheling	*41.50-42.00*
No. 1 Bundles	*41.50-42.00*
No. 2 Bundles	*30.50-31.00*
Machine Shop Turnings	*26.00-27.00*
Mixed Borings, Turnings	*28.50-29.50*
Short Shovel Turnings	*28.50-29.50*
Cast Iron Borings	*28.50-29.50*
Low Phos.	*42.50-43.00*

Cast Iron Grades

No. 1 Cupola	*48.00-49.00*
Charging Box Cast	*44.00-45.00*
Stove Plate	*43.00-44.00*
Heavy Breakable Cast	40.00-42.00
Unstripped Motor Blocks	35.00-36.00
Brake Shoes	*36.00-37.00*
Clean Auto Cast	*48.00-49.00*
No. 1 Wheels	*44.00-45.00*
Burnt Cast	*38.00-39.00*

Railroad Scrap

No. 1 R.R. Heavy Melt.	*48.00-48.50*
R.R. Malleable	49.00-50.00
Rails, 3 ft and under	50.00-51.00
Rails, 18 in. and under	51.00-52.00
Rails, Random Lengths	49.00-50.00
Cast Steel	42.50-43.00
Railroad Specialties	43.50-44.00
Uncut Tires	49.00-50.00
Angles, Splice Bars	51.00-51.50

VALLEY

No. 1 Heavy Melt. Steel	*$43.50-44.00*
No. 2 Heavy Melt. Steel	*38.50-39.50*
No. 1 Bundles	*43.50-44.00*
No. 2 Bundles	*32.50-33.00*
Machine Shop Turnings	*28.00-28.50*
Short Shovel Turnings	*30.50-31.00*
Cast Iron Borings	*30.50-31.00*
Low Phos.	*44.50-45.00*

Railroad Scrap

No. 1 R.R. Heavy Melt.	*48.00-48.50*

PHILADELPHIA

No. 1 Heavy Melt. Steel	*$35.00-36.00**
No. 2 Heavy Melt. Steel	*33.00**
No. 1 Busheling	*34.00-35.00**
No. 1 Bundles	*35.00-36.00**
No. 2 Bundles	*29.00-30.00**
Machine Shop Turnings	*24.00-25.00*
Short Shovel Turnings	*25.00-26.00*
Mixed Borings, Turnings	*23.00-24.00*
Low Phos. Punchings and Plate, elec. fur. grade	*40.00-41.00*
Low Phos. Plate, 5 ft & Under	*40.00-41.00*
Elec. Furnace Bundles	37.00*
Heavy Turnings	37.00-38.00*
No. 1 Chemical Borings	Nominal
Knuckles and couplers	*43.00-44.00**
Steel car wheels	*43.00-44.00**

Cast Iron Grades

No. 1 Cupola Cast	34.00-35.00
No. 1 Machinery Cast	39.00-40.00
No. 1 Yard Cast	34.00-35.00
Charging Box Cast	36.00-37.00
Heavy Breakable Cast	36.00-37.00
Unstripped Motor Blocks	29.00
Clean Auto Cast	39.00-40.00
No. 1 Wheels	41.00-42.00
Malleable	45.00-46.00

* Nominal.

CINCINNATI

No. 1 Heavy Melt. Steel	$38.00
No. 2 Heavy Melt. Steel	33.00
No. 1 Busheling	38.00
No. 1 Bundles	38.00
No. 2 Black Bundles	32.00
No. 3 Bundles	27.00
Machine Shop Turnings	21.00
Short Shovel Turnings	24.00
Mixed Borings, Turnings	23.00
Cast Iron Borings	24.00

Cast Iron Grades

No. 1 Cupola Cast	*48.00*
Charging Box Cast	38.00
Stove Plate	33.00
Heavy Breakable Cast	40.00
Unstripped Motor Blocks	29.00
Brake Shoes	28.00
Clean Auto Cast	*48.00*
Drop Broken Cast	*50.00*
Low Phos., 18 in. and under	*48.00*

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.00
R.R. Malleable	44.00
Rails, Rerolling	46.00
Rails, Random Lengths	*43.00*
Rails, 18 in. and under	*52.00*

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 2 Heavy Melt. Steel	*$27.00-28.00*
No. 1 Bundles	*39.00-40.00*
No. 2 Bundles	*26.50-27.00*
No. 1 Busheling	*38.50-39.00*
Machine Shop Turnings	*23.50-24.00*
Forge Flashings	*38.50-39.00*
Short Shovel Turnings	*25.50-26.00*
Cast Iron Borings	*25.50-26.00*
Punchings & Plate Scrap	*38.00-39.00*

Cast Iron Grades

No. 1 Cupola Cast	40.00-41.00
Heavy Breakable Cast	35.00-36.00
Clean Auto Cast	44.00-45.00

BUFFALO

No. 1 Heavy Melt. Steel	*$39.50-40.00*
No. 2 Heavy Melt. Steel	*36.50-37.00*
No. 1 Busheling	*36.50-37.00*
No. 1 Bundles	*37.50-38.00*
No. 2 Bundles	*34.50-35.00*
Machine Shop Turnings	*30.50-31.00*
Mixed Borings, Turnings	*30.50-31.00*
Cast Iron Borings	*30.50-31.00*
Short Shovelings	*32.50-33.00*
Low Phos.	*42.50-43.00*

Cast Iron Grades

No. 1 Machinery	40.50-41.00
No. 1 Cupola	37.50-38.00
Stove Plate	38.00-39.00
Malleable	34.50-35.00

Railroad Scrap

Rails, 2 ft. and under.	48.50-49.00
Rails, random size	42.50-43.00

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	*$32.00**
No. 2 Heavy Melt. Steel	*26.00-27.00*
No. 1 Busheling	*31.00*
No. 1 Bundles	*32.00*
No. 2 Bundles	*25.00-25.50*
Machine Shop Turnings	*20.00*
Mixed Borings, Turnings	*20.00*
Short Shovel Turnings	*21.00-22.00*
Punchings & Plate Scrap	*32.00*
Low Phos. Plate, 5 ft & under	*32.00*
Elec. Furnace Bundles	*32.00*

Cast Iron Grades

No. 1 Cupola Cast	*29.00-29.50*
No. 1 Machinery	30.00-31.00
Charging Box Cast	*28.50-29.50*
Heavy Breakable	*28.50-29.50*
Unstripped Motor Blocks	23.00-23.50
Malleable	36.50

* Previous week's price: $35-$36.

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	*$31.00-32.00*
No. 2 Heavy Melt. Steel	*25.00-26.00*
No. 1 Bundles	*31.00-32.00*
No. 1 Busheling	*29.50-30.00*
Machine Shop Turnings	*23.00-24.00*
Mixed Borings, Turnings	*22.00-23.00*
Short Shovel Turnings	*23.50-24.50*
Bar Crops and Plate	*34.00-35.00*
Punchings & Plate Scrap	*34.00-35.00*
Chemical Borings	*24.00-25.00*

Cast Iron Grades

No. 1 Cupola Cast	33.00-34.00
Mixed Cast	29.00-30.00
Heavy Breakable Cast	31.00-32.00
Stove Plate	26.00-27.00

CHICAGO

No. 1 Heavy Melt. Steel	*$37.00-38.00**
No. 2 Heavy Melt. Steel	*35.00-36.00**
No. 1 Bundles	*35.00-36.00**
No. 2 Bundles	*32.00-33.00**
Machine Shop Turnings	*23.50-24.50*
Mixed Borings, Turnings	*23.50-24.50*
Short Shovel Turnings	*25.00-26.00*
Cast Iron Borings	*24.00-25.00*
Low Phos.	40.00-41.00
Elec. Furnace Bundles	*37.00-38.00*
Heavy Turnings	30.00-31.00
Cut Structurals	38.00-39.00

Cast Iron Grades

No. 1 Cupola Cast	*46.00-48.00*
Clean Auto Cast	*47.00-48.00*
No. 1 Wheels	38.00-39.00
Stove Plate	38.00-39.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	*39.00-40.00*
Malleable	44.00-45.00
Rails, Rerolling	*49.00-50.00*
Rails, Random Lengths	43.00-44.00
Rails, 2 ft and under.	47.00-48.00
Rails, 18 in. and under	48.00-49.00
Railroad Specialties	40.00-41.00
Angles, Splice Bars	43.50-44.50

* Nominal

BIRMINGHAM

No. 1 Heavy Melt. Steel	$31.00-32.00
No. 2 Heavy Melt. Steel	29.00-30.00
No. 1 Busheling	29.00-30.00
No. 2 Bundles	27.00-28.00
Machine Shop Turnings	25.00-26.00
Mixed Borings, Turnings	26.00
Short Shovel Turnings	27.00-28.00
Cast Iron Borings	24.00-25.00
Bar Crops and Plate	37.00-38.00
Cut Structurals	36.00-37.00

Cast Iron Grades

No. 1 Cupola Cast	36.00-37.00
Stove Plate	32.00-33.00
No. 1 Wheels	33.00-34.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	35.00
R.R. Malleable	nominal
Rails, Rerolling	44.00-45.00
Rails, 3 ft and under.	nominal
Angles and Splice Bars	39.00-40.00

ST. LOUIS

No. 1 Heavy Melt. Steel	*$36.00-38.00*
No. 2 Heavy Melt. Steel	*33.00-34.00*
No. 1 Bundles	*36.00-38.00*
No. 2 Bundles	*33.00-34.00*
No. 3 Bundles	29.00-30.00
Machine Shop Turnings	23.00-24.00
Short Shovel Turnings	26.00-28.00

Cast Iron Grades

No. 1 Cupola Cast	39.00-41.00
Charging Box Cast	*36.00-38.00*
Heavy Breakable Cast	38.00-39.00
Brake Shoes	*37.00-39.00*
Clean Auto Cast	40.00-42.00
Burnt Cast	35.00-36.00

Railroad Scrap

R.R. Malleable	*39.00-41.00*
Rails, Rerolling	*52.00-53.00*
Rails, Random Lengths	*41.00-43.00*
Rails, 3 ft and under	*47.00-49.00*
Uncut Tires	*41.00-43.00*
Angles, Splice Bars	*46.00-48.00*
Railroad Specialties	*45.00-46.00*

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*$22.00*
No. 2 Heavy Melt. Steel	*20.00*
No. 1 Bundles	*18.00*
No. 2 Bundles	*17.00*
No. 3 Bundles	*15.00*
Machine Shop Turnings	9.00

Cast Iron Grades

No. 1 Cupola Cast	*34.00*

Railroad Scrap

No. 1 R.R. Heavy Melt.	*22.00*
Rails, Random Lengths	*22.00*

SEATTLE

No. 1 Heavy Melt. Steel	*$20.00*
No. 2 Heavy Melt. Steel	*20.00*
No. 1 Busheling	*17.50*
Nos. 1 & 2 Bundles	*18.00*
No. 3 Bundles	*14.00*
Machine Shop Turnings	*15.00*
Mixed Borings, Turnings	*15.00*
Punchings & Plate Scrap	*29.50-32.50*
Cut Structurals	*29.50-32.50*

Cast Iron Grades

No. 1 Cupola Cast	*27.00-32.00*
Heavy Breakable Cast	*27.00*
Stove Plate	*27.00*
Unstripped Motor Blocks	*25.00*
Malleable	*27.00*
Brake Shoes	*25.00*
Clean Auto Cast	*27.00-32.00*
No. 1 Wheels	*27.00-32.00*

Railroad Scrap

No. 1 R.R. Heavy Melt.	*21.00*
Railroad Malleable	*27.00*
Rails, Random Lengths	*21.00*
Angles and Splice Bars	*21.00*

LOS ANGELES

(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	*$22.00*
No. 2 Heavy Melt. Steel	*20.00*
Nos. 1 & 2 Bundles	**16.00**
No. 3 Bundles	13.00
Machine Shop Turnings	**5.00**
Mixed Borings, Turnings	**5.00**
Punchings & Plate Scrap	*30.50*

Cast Iron Grades

No. 1 Cupola Cast	38.00-39.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	*22.00*
Rails, Rerolling	*33.00*

HAMILTON, ONT.

(Delivered prices)

Heavy Melt.	$30.00
No. 1 Bundles	30.00
Mechanical Bundles	28.00
Mixed Steel Scrap	28.00
Mixed Borings, Turnings	23.00
Rails, Remelting	30.00
Rails, Rerolling	33.00
Busheling	24.50
Bushelings new factory, prep'd	28.00
Bushelings new factory, unprep'd	23.00
Short Steel Turnings	23.00

Cast Iron Grades

Cast	**40.00-43.00***

*** F.o.b. shipping point.**

UNIVERSITY OF MICHIGAN LIBRARIES

Sheets Strip . . .

Sheet and Strip Prices, Page 139 & 140

Cleveland—Shortage in flat-rolled is really hurting now. More consumers are turning to premium markets for stop-gap supplies. Mill shipments are not equal to demand. Carryover into third quarter will take most of that period's output. Automotive, appliance and other consumer goods manufacturers' requirements show no sign of slackening. And vacation shutdowns will provide no respite for the mills since consumers will take shipments without interruption. Larger sheetmakers contemplate no early upward revision in prices. However, smaller producers are effecting increases. Detroit Steel Corp. has raised cold-rolled strip $7 per ton; Superior Steel Corp. increased hot-rolled strip $5. Galvanized sheet prices are automatically higher in step with the increase in zinc. Stainless sheet and strip demand is strong with deliveries steadily extending.

New York—Sheet supply is so stringent some consumers are wishing for a return to priorities which would provide them with a little more tonnage than they are now receiving. However, the great majority of consumers are willing to take their chances rather than have priority controls reinstated. Sheet mills are virtually out of the market for third quarter and could easily sell their output for the fourth quarter.

Boston—All but two producers of cold-rolled strip in New England have advanced low-carbon (0.26 and under) $7 a ton.

Philadelphia—Most sellers of stainless strip are booked into last quarter. One eastern producer is accepting orders for first quarter of next year. Sellers are probably booked 20 weeks ahead on the average. Promises on stainless sheets are much better than on strip.

Pittsburgh—Superior Steel Corp., Carnegie, Pa., advanced hot-rolled strip $5 per ton to 3.50c in line with similar action of other small producing interests. Major mills say no price action is imminent on hot or cold-rolled sheet and strip.

Cincinnati — Demand for tonnage from district sheet mills persists. With the half-year mark nearing, it appears more certain capacity operations will be required through fourth quarter although books are not opened for that period.

Chicago — Leading producers are holding to prices established months ago. Opinion prevails that if scrap is headed downward some of the need for price adjustments will disappear. Pressure on suppliers is greatest in history. One mill doing sheet conversion has contracts which will take all conversion capacity for hot-rolled sheets throughout remainder of this year. Up to now, only cold-rolled was completely sold out. Consumers are taking more notice of gray market offerings.

Birmingham—Pressures for sheets is slightly easier, but mills continue to allocate supplies.

San Francisco—Shortages of sheets are steadily increasing. Although there has been no widespread effect on fabricator operations, smaller firms are feeling the pinch sharply.

"Drive thy business — let not that drive thee."

—Ben Franklin's Almanac, 1757

These days thee must work a month for the taxgatherer before thee begins to work for thyself. Keep a firm hand on the wheel of savings to bolster thy "nett after taxes."

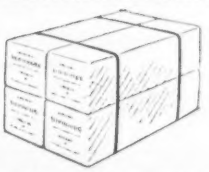
—Acme Steel's Notebook, 1950

How long, Mr. Comptroller, since you broke "Miscellaneous" down into its multitude of sins? Do it—and you may uncover profit leaks that are subtracting real money from the profit column.

Most companies find plenty of such leaks to plug in packaging, shipping and materials handling operations. Acme salesengineers are specialists in finding these leaks—then plugging them. In 9 out of 10 cases, we can point the way to greater efficiency and good, solid thrift with Acme Methods and Acme flat steel strapping, Acme stitching machines and wire, and other Acme Steel products.

We have already proved this for the more than 50,000 customers we now serve. Two specific cases are reported here. It takes just a minute to read them and call us in.

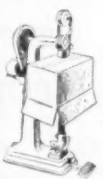
Acme sales engineers, technical facilities and nationwide service are ready to start helping you. Reach for the telephone and call the Acme Steel service office nearest you. (There are 46 of these offices in the principal cities of the U. S. and Canada.) Or send the coupon for details on your special field.



Old Way: $4.01 express charges
Acme Steel Way: $2.26 " "

Cash Saving $1.75 per bundle

By bundling 4 cartons with Acme Steelstrap, instead of shipping separately, Exola Products, Inc., of Los Angeles, cut shipping costs 43%.



Materials cost cut 87%
Time saved 30%

Yes, and production was increased, too, and stronger, better-quality packaging achieved when B&T Metal Co., Columbus, Ohio, put Acme Silverstitchers to work on their packaging problem.

ACME STEEL

You're invited to watch us roll out the strip steel when you're in or near Chicago. Our rolling mills at Riverdale, Illinois, covering more than 1,700,000 square feet, house one of the largest, fastest strip steel operations in the world.

ACME STEEL CO. CHICAGO

ATTACH THIS COUPON TO YOUR BUSINESS LETTERHEAD

ACME STEEL COMPANY, Dept. S-60, 2838 Archer Avenue, Chicago 8, Illinois
We manufacture_____. Please send me booklets on Acme Methods checked.

- ☐ Please have sales engineer call.
- ☐ **Packaging, Shipping, Materials Handling**—"Savings in Shipping" tells how to save money and safeguard customer good will with Acme Steelstrap.
- ☐ **Shipping (Carload and L.C.L.)**—"Acme Unit-Load"—The story of reduced damage claims and better handling for shippers.
- ☐ **Bag and Box Assembly**—"Profit by Stitching" demonstrates cost-cutting Acme Silverstitchers and Acme-Champion Stitchers.
- ☐ **Product Assembly**—"Acme-Morrison Metal Stitchers"—for savings in fastening metal-to-metal or metal-to-other materials.
- ☐ **Book Assembly**—"Acme-Morrison Book Stitchers" for savings in the graphic arts field.

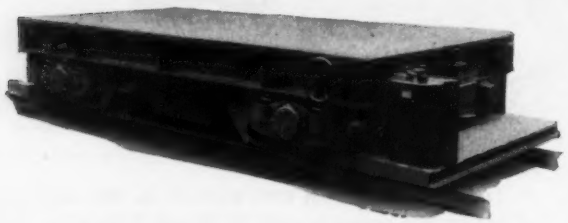
NAME_____ POSITION_____
COMPANY_____
STREET_____
CITY_____ ZONE_____ STATE_____

ACME STEEL CO. CHICAGO

ATLAS
INTRA PLANT CARS

DESIGNED AND ENGINEERED FOR YOUR SPECIFIC NEEDS

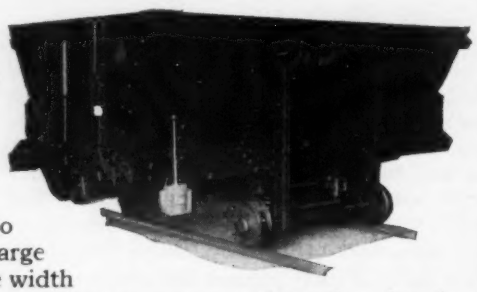
STORAGE BATTERY FLAT CAR



60-TON CAPACITY

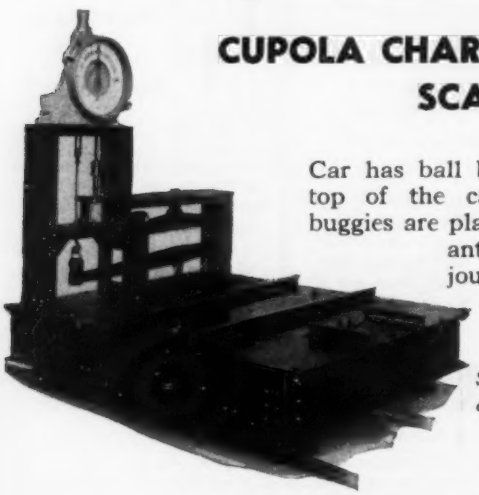
This self-propelled flat car operates on standard gauge track. Car provided with hydraulic electric brakes that can be operated by handwheel when long overhanging loads are encountered. These battery propelled cars are often provided with charging equipment mounted on car.

FURNACE CHARGING CAR, 8-TON CAP. CENTER DUMP



The discharge gates are so arranged as to spread the charge to the best advantage over the width of the furnace. Gates are hydraulically operated through a hand pump. Car is mounted on anti-friction roller bearings with spring mounted journals. Car provided with automatic engine couplers.

CUPOLA CHARGING SCALE CAR



Car has ball bearing steel turntable on top of the car upon which charging buggies are placed and weighed. Car has anti-friction bearings at main journals.

Send for illustrated booklet on all types of intra-plant cars.

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ENGINEERS MANUFACTURERS

Steel Bars . . .

Bar Prices, Page 139

Boston — For government shops, Springfield, Watertown and Boston navy yard, carbon and alloy bar inquiry is heavier, including 585 tons for Springfield, nearly half alloy, closing June 19. Boston navy yard is buying 160 tons of alloy, 2⅝-inch for forged chain, while forging requirements for Watertown are heavier. Hot-rolled carbon bar deliveries are extended to October and some smaller sizes beyond. Cold drawn is available for August delivery.

New York—Although bar consumers have not been forced to curtail production because of lack of steel, they are beginning to eat into inventories and are having increasing difficulty getting mill shipments. Some hot bar producers are booked through the third quarter; at least two producers are accepting tonnage for fourth quarter. Allocation program is expanding and may be fairly general by the time the fourth quarter draws near. Demand is highly diversified.

Pittsburgh—Sellers of hot-rolled carbon and alloy bars anticipate full production schedules throughout third quarter. Major consuming groups show no signs of reducing requirements and many consumers contend projected upturn in production schedules must be abandoned due to steel scarcity. A few consumers are attempting to get on mill schedules for "protective" reasons. Jones & Laughlin Steel Corp. expects to discontinue rolling schedules on 10 and 12-in. bar bills July 1, to make room for open-hearth expansion program at Pittsburgh Works.

Philadelphia—Hot carbon bar tonnage can be had for delivery in late August. However, some mills are covered for third quarter and at least two are accepting tonnage for fourth quarter. Foreign bars are coming in along the seaboard in increasing amount.

Cleveland—Pressure for merchant bars shows no signs of slackening with consumers eating steadily into inventories. Bar mills lack sufficient semifinished tonnage to support full operations and their output is falling considerably under demand. Deliveries are steadily lengthening. Mills now are so heavily booked for third quarter little new tonnage can be accepted for that period. Cold-finished bars are also tight with the cold-finishers unable to get all the hot bars they need. Demand for alloy bars is stronger, but supplies in this area are still relatively easy.

Chicago—Bar mill operators are scheduling higher than usual rates to make up production that will be lost during vacations. Consumers are pressing for delivery on schedule. Isolated cases where manufacturing is impeded by lack of bars continue, especially among farm implement and automotive accounts.

Los Angeles—Fabricators' bar requirements are heavier. Abundant mill facilities in this district allow producers to roll virtually to demand. Deliveries range from 30 days to 60 days.

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Plates . . .

Plate Prices, Page 139

New York—Despite lag in ship work and only a modest increase in demand for pressure vessels, eastern plate mills are steadily building up order backlogs. In light gages, virtually all producers are booked up for the third quarter; in heavier gages, they are booked up to mid-August and beyond. Certain mills haven't any capacity left for even the heavier gages before October.

Philadelphia—Although plate mills have not opened books for fourth quarter they could book substantial tonnages of light gage plate for that period.

Birmingham—Mills do not anticipate any real relief in plate supply soon. Demand holds heavy for pressure vessels, tanks, carbuilding and structurals.

Los Angeles—Fabricators' needs for all plate gages are mounting, particularly lighter gages. Mill deliveries of heavy plates are extended 30-45 days. Kaiser Steel Corp. is sold through third quarter and has not opened fourth quarter books.

Seattle—Local tank and boiler shops have fair backlogs in small tonnages, water and oil storage tanks predominating. No outstanding jobs are up for figures.

Wire . . .

Wire Prices, Page 141

Boston—Demand for wire is slightly heavier with mill schedules filled for August. Some specialty tonnage is booked beyond, and September openings are being taken up. Automotive requirements are heavy and sustained. Good volume is moving for aircraft. Users of heading wire are taking full allocations, although in most cases inventories are in balance with screw manufacturers. Imports of rods and nails are heavier. Close to 4000 tons of nails came in recently at New York. Cable backlogs are larger.

Cleveland—Strong demand for wire products of all kinds continues. Heavy tonnage carryover into third quarter is indicated. Prices are firm but recent increases in zinc prices hint of possible advances on galvanized products. Dickson Weatherproof Nail Co., on June 13 increased the extra for galvanizing standard nails, 14½ gage and larger, to $2.80 per cwt, and the extra on 15 gage and smaller nails to $3.30. The increased extras apply to common nails, box nails, casing nails, etc. The company also announced the galvanizing extra on ring shank and screw shank nails, 14½ gage and heavier, was raised to $3.00 per cwt, and on 15 gage and lighter to $3.60.

Pittsburgh — Sellers have experienced little difficulty in filling August production schedules for heavy and light gage manufacturers wire. Merchant wire products are not in as short supply as manufacturers items.

Chicago—Merchant wire products are starting to share the spotlight as fast-moving steel merchandise. Tightness now is developing in nails and woven wire fencing. Improved sales of bale ties are noted.

Production reports prove that Keystone's new "special processed" cold heading wire effects considerable savings in the manufacture of Phillips head, clutch head and cross recessed head screws.

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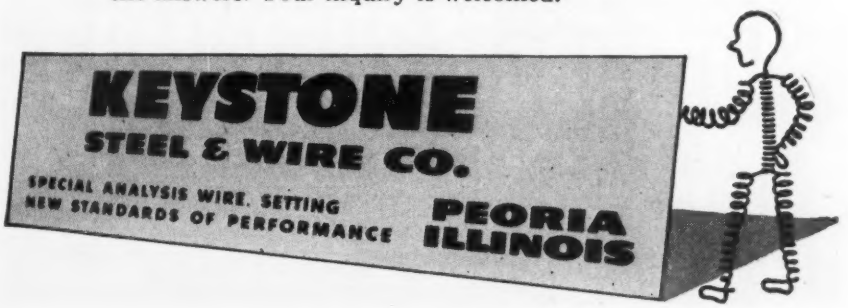
Regardless of the performance demanded in your wire products, consult Keystone for the materials to meet your most exacting specifications. If special treatment is required, Keystone's metallurgical research and testing facilities are available to supply the answers. Your inquiry is welcomed.



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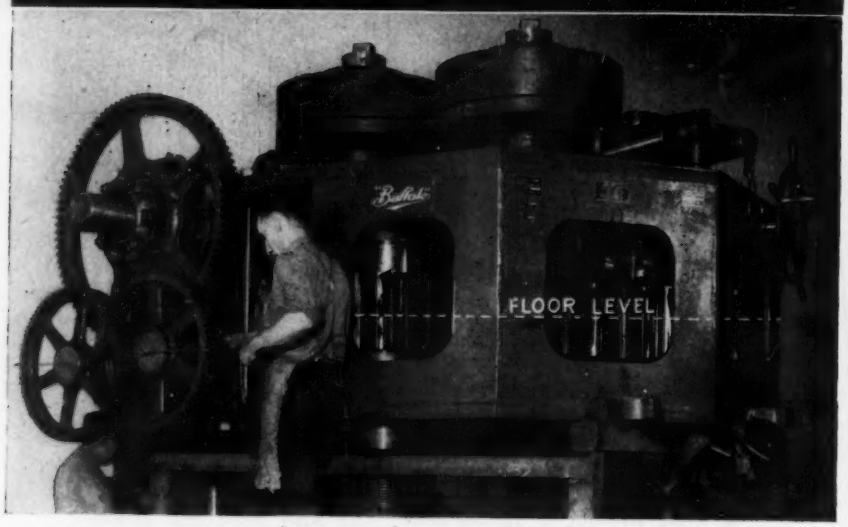

Machine is driven thru a speed reducer below floor level. Gearing above is for the third roll adjustment, which is also motor driven.

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Structural Shapes . . .

Structural Shape Prices, Page 139

New York—Shape deliveries are expanding steadily, although shipments of standard sections can still be had by late August. Fabricators claim difficulty in getting nearby deliveries is slowing down operations, as their inventories are being depleted rapidly in some items.

Boston—Volume of structural work being estimated is heavy, decline in bridge inquiry for Massachusetts being balanced by more volume for other states, notably Vermont. Deliveries average September-October for district and outside shops and contracts are placed on a price rather than delivery basis. For a viaduct connecting two islands, Boston harbor, 3400 tons will be fabricated by Bethlehem Steel Co.

Philadelphia — Miscellaneous demand for structural steel shows further gain but public work, especially bridges, still dominates activity. Several new bridge projects are up for estimates.

Los Angeles—Demand for structurals is stronger as fabricators' backlogs grow.

San Francisco—Standard shapes remain fairly plentiful. An increasing number of private construction awards is in prospect for summer, spurred by the continued high rate of general business activity.

Tin Plate . . .

Tin Plate Prices, Page 140

Pittsburgh—Pressure for tin mill products shows no signs of easing throughout third quarter. Increased electrolytic capacity should give some relief in the unbalanced demand-supply situation. In addition to electrolytic expansion programs previously announced, U. S. Steel is considering a line at Morrisville, Pa.

Tubular Goods . . .

Tubular Goods Prices, Page 142

Boston—Merchant steel pipe distributors are taking up August allocations in most cases, only small tonnages of buttweld being open. Contractor volume is holding at high level and utilities are inquiring for seamless to cover against introduction of natural gas. Relatively little tonnage has been bought, but total needs will be around 50,000 tons for lateral and lead-in lines.

Pittsburgh — Other producers are considering following the recent $8 per ton price advance on galvanized pipe initiated by the Mercer Tube & Mfg. Co. to reflect recent increases in zinc prices. Pressure for pipe deliveries increases. Petroleum interests are back in the conversion market.

Los Angeles—Pressure from consumers for pipe is extreme. Deliveries from jobbers range from 4 to 6 weeks.

San Francisco—Continued high rate of home building has tightened supplies of pipe, especially cast iron material.

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Reinforcing Bars . . .

Reinforcing Bar Prices, Page 139

Boston—Fabricating facilities are taxed to meet current demand for reinforcing bars and steel is available in less volume to some distributors. Substantial volume of new construction coming up for estimates is of concrete construction. Bridge and highway work requirements are sustained, bolstered by housing projects and educational buildings.

Cleveland—Active demand for reinforcing bars and mesh is reported here with the building season in full swing. Small jobs dominate market activity, with public work most prominent. Some shading continues to be reported but it is said to be less severe than a month or two back. Competition from foreign bars is reported increasing.

Seattle — Fabricators have fair backlogs, but are seeking new commitments for late summer and fall delivery. Small jobs predominate. Alaska housing and military projects involve moderate tonnages. Plants report deliveries from eastern mills are slowing, three months at present being the best. Coast mills can supply quickly.

Alloy Steel . . .

Pittsburgh — Stainless steel producers are booked into September on strip, August on sheets, and within normal processing time on shapes, plates and bars. Upward price action on stainless products is under consideration.

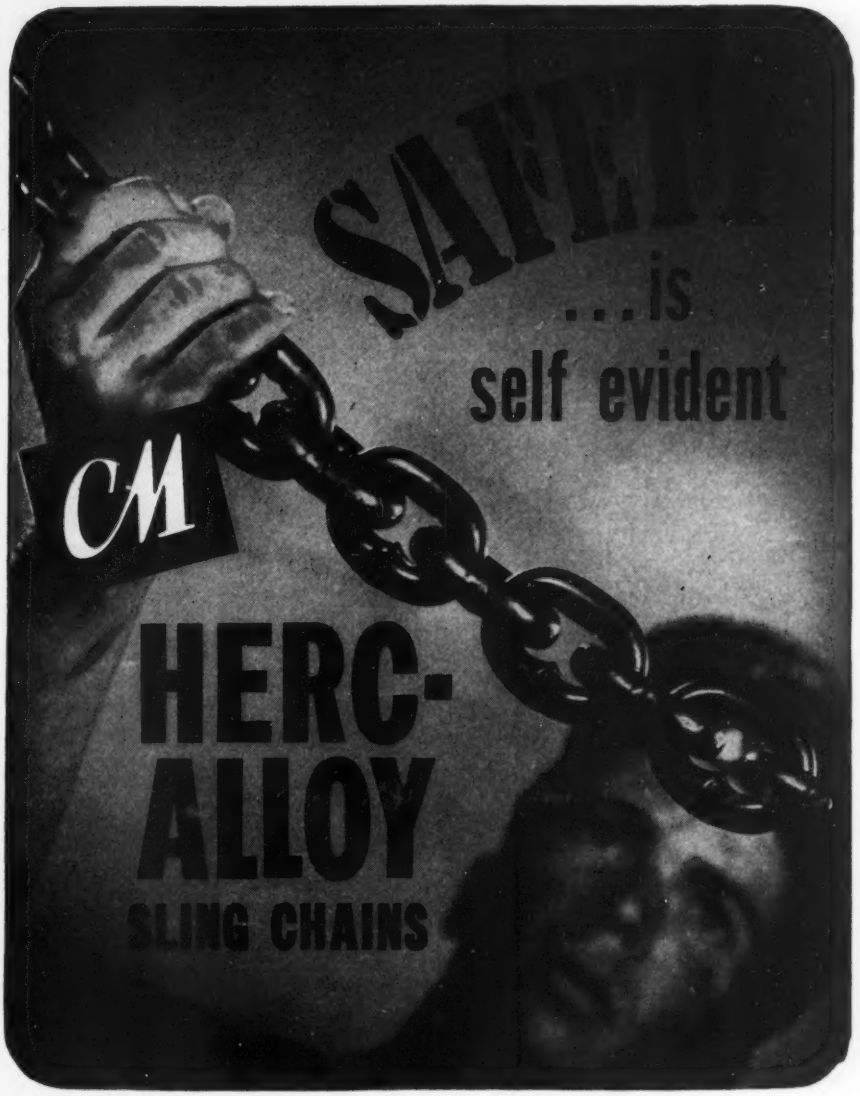
Cleveland—Producers of alloy steel may be compelled to advance prices soon to offset recent sharp increases in scrap, nickel and other raw material costs. Cost of producing Timken Roller Bearing Co.'s 4620 alloy steel, a nickel-molybdenum type used in tapered roller and other bearings and gears as well as other products, rose $18.20 or 31 per cent per ton of ingot output in the last three months. Timken's scrap costs are up from $35 per ton three months ago to as high as $52. Nickel went up 8 cents per lb recently.

Pig Iron . . .

Pig Iron Prices, Page 138

New York—Domestic pig iron is becoming tighter, due partly to drain on tonnage by midwestern users. Some protective covering here is noted, foundries placing tonnage at a faster rate than they are actually consuming it. Importers of pig iron are experiencing a livelier interest not only because of a somewhat tighter domestic supply but because of high scrap prices and lower prices for foreign iron as compared with the domestic market. Some importers have advanced their prices $3 to $4 a ton, but are still several dollars a ton under domestic offerings.

Pittsburgh—Production by captive foundries is well sustained, notably for heavy industrial machinery, enamelware and electrical appliance industries. Foundry pig iron supply pinch is expected. The lone merchant foundry iron stack, down for relining since May 10, will not be blown in until



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early July. Carnegie-Illinois blew in No. 2 furnace at Edgar Thomson making 43 out of 47 district units active.

Philadelphia—Brisk pig iron demand this month is expected to decline in July due to vacations. General Steel Castings Co., Eddystone, Pa., has resumed operations following a strike which lasted three weeks.

Cleveland—Merchant pig iron demand continues to increase. While no shortage is reported here sellers are shipping every pound of metal they produce and there is no surplus. Meanwhile, specifications from the foundries continue heavy and show no sign of slackening. Motor castings makers are especially busy. All nine blast furnaces in this immediate district are operating.

Cincinnati—Shipments are slower, the only indication to district melters of the tightening in supply. The melt is unchanged at a level below capacity, especially jobbing foundries.

Birmingham — Pig iron demand holds steady and may get further ahead of supply with a Republic blast furnace out for repairs. Settlement of a two months' plumbers strike has added to needs.

Seattle—Last week 2500 tons of pig iron from the German-British zone were discharged here, the same vessel having 9400 tons for coast delivery. Plants are melting foreign exclusively, domestic producers apparently being out of the market.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 142

New York—Bolt and nut buying is being stepped up rapidly. Makers' backlogs now run four to six weeks and beyond in some instances. Especially heavy is demand for fastenings from the construction industry.

To date, eastern makers of fasteners have not had to restrict production because of shortage of steel; however, some indicate this may not be far off. Steel inventories at bolt plants are being reduced and mill delivery promises on bars and wire rods are being extended. Certain bar producers have allocation in effect for third quarter.

Demand for fasteners is heavier despite the fact hardware requirements are not particularly heavy and export requirements, as a whole are very light. Japan is beginning to dominate the Far East markets for bolts and nuts and Great Britain, Belgium, France and Germany are giving American makers strong competition in South America and certain other parts of the world. Their prices are substantially under those of American sellers.

Cleveland — Industrial fastener manufacturers are entertaining large volume business but are encountering difficulty obtaining all the steel they require to maintain full production schedules. Some of the smaller producers are forced to turn to the warehouse and premium markets for supplies. And some sellers are accepting new orders only within the limits of their steel supply. Generally prices are firm but some shading of semifinished nut quotations was reported in this area last week.

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Iron Ore . . .

Iron Ore Prices, Page 143

Cleveland—Lake vessel operators are steadily stepping up the movement of iron ore from the upper lakes. In the seven days ended June 12, latest period for which data are available, the shippers brought down 2,785,811 gross tons. This compared with shipments of 2,724,023 tons in the like week of 1949. Cumulative shipments to date this year now stand at 14,268,259 tons, which is 11,040,812 tons less than had been shipped on the corresponding date in the 1949 season.

Scrap . . .

Scrap Prices, Page 146

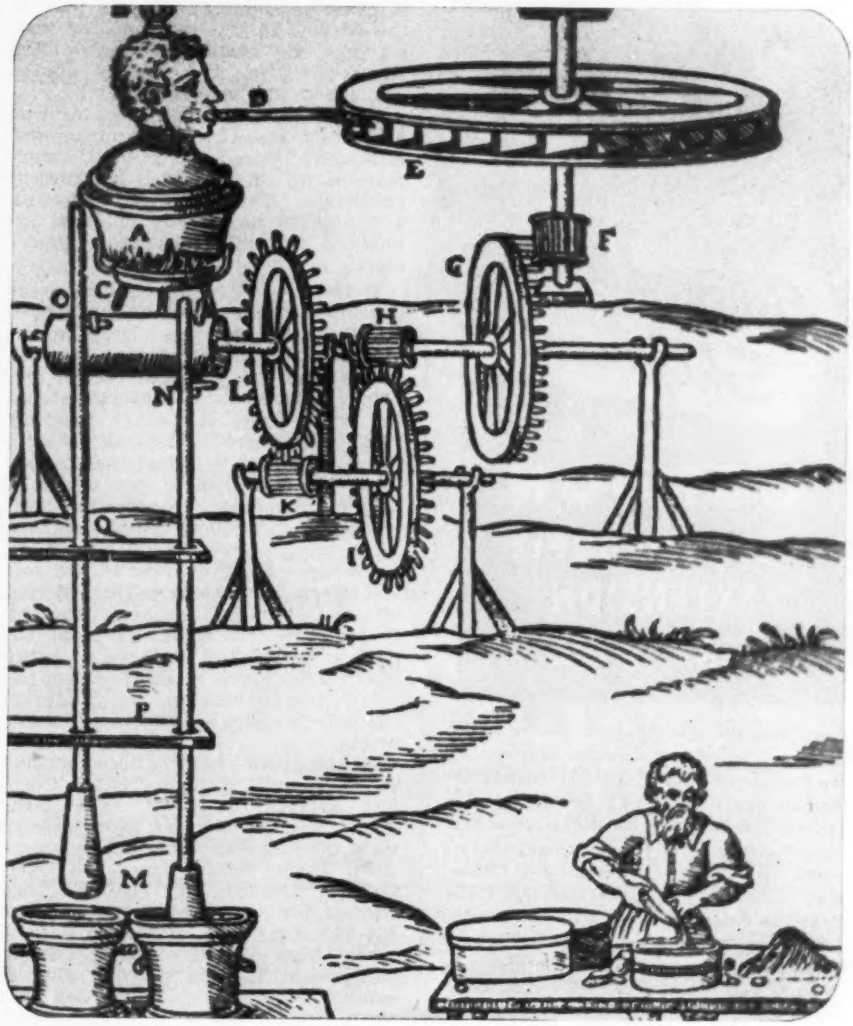
Pittsburgh—Break in upward scrap price spiral is substantiated by brokers' offerings $3 to $4 below the last representative mill purchase at $46. Brokers are trying to recoup losses sustained on the upswing by buying at lower prices to fill large tonnage commitments at around the $46 level. It is too early to determine how successful this move will be. Some mills report sharp increase in tonnage offered in the last two weeks. Mills have comfortable inventories. One mill reports broker offerings of No. 1 railroad heavy melting at $45-$46 compared with a purchase price of nearly $50 on B. & O. material.

Philadelphia — Prices on major open-hearth grades of steel scrap apparently have passed their peak. Recent high prices have stimulated collections and, with district consumers coasting a bit, brokers are able to pick up tonnage at slightly lower levels. Most trade interests believe the market advanced too rapidly and that a corrective period is due; also, that as long as steel operations remain around current levels there will be no precipitous decline, even allowing for an increase in arrivals of foreign scrap. The first cargo of European scrap against a recent order by Bethlehem Steel Co. arrived last week in Baltimore.

New York—Brokers have reduced buying prices for steel scrap appreciably from a high of ten days or so ago. Material is coming out more freely and consumers are buying cautiously. As long as steel operations continue at a high rate, however, the market is not expected to go into a tailspin. Along with a drop in steel scrap, prices on leading cast grades have declined slightly after holding unchanged for several weeks.

Buffalo — Scrap declined $2 to $2.50 a ton as weakness gripped the market with withdrawal of all leading mill consumers from the market. No sales were reported, but dealers admit the market is off at least as much as the posted decline. Easement followed by only about one week sales aggregating about 25,000 tons which were made at the old prices. Mills moved to the sidelines well fortified with abundant reserve stocks and heavy shipments of scrap by water. About 25,000 tons arrived last week by barge.

Cleveland — Rapid price advance in scrap has been checked here and a moderate decline has been posted.



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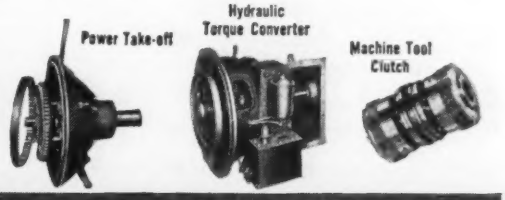

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A price of about $49.50 was paid in the Valley at the peak of the rise, whereas the market is now quoted $43.50-$44. No. 1 heavy is quoted $41.50-$42 in Cleveland.

Cincinnati — Most grades of iron and steel scrap remain unchanged, although foundry grades were marked up on the basis of current purchases. The market is unsettled, and halt to the steady climb is attributed to mill resistance. Dealer stocks are coming out freely.

Detroit — Expected price decline developed, with steelmaking grades off $1 to $2 per ton. Drop in requirements of local electric furnace plants was the principal factor, one being supplied from material stored for some time, the other partially from earmarked General Motors scrap. Further it is understood both these plants will close two weeks in July for inventory. Unconfirmed reports tell of 80,000 tons of Japanese scrap being offered locally at $36.

Chicago—Scrap market turned soft last week as dealers began offering all the tonnage brokers wanted. Prices were off about $2 from the peak. Earmarked material is being taken by one mill at the previous top price through brokers, but grades in the open market are moving at lower prices.

Birmingham—Scrap prices continue to fluctuate. Republic Steel Corp. and Atlantic Steel Co. have withdrawn from the market. Most brokers view the move as a stabilizing one.

St. Louis—Scrap prices are leveling off. Granite City Steel Co. contracted for 40,000 tons of No. 2 at $34-$35 last week compared with a recent high of $36. Pull of outside consumers on this market also is catching up as the differential narrows.

Los Angeles — Mills, faced with prospect of flow of scrap from this district to more profitable eastern markets, advanced buying prices from $2 to $3.60 on most grades.

San Francisco—Scrap prices are $2 a ton higher on principal steelmaking grades. No. 1 heavy melting is quoted at $22.

Seattle—Scrap prices are quoted $2 higher. Mills report ample receipts for current needs. Foundries are paying up to $27.50 to truckers for No. 1 cupola cast. Operations are up and demand is increasing with the seasonal rise in general construction.

Warehouse . . .

Warehouse Prices, Page 143

Pittsburgh—With exception of galvanized sheets, distributors are now uniform at the $1 to $4 higher price levels recently put into effect on hot-rolled carbon bars and sheets, standard shapes, wide flange beams, plain and floor plates. One interest, that previously quoted 25 cents per 100-pound premium price on galvanized, is now asking a 10-cent premium. Daily average shipments from distributors' stocks are steady. Unbalanced inventories are a retarding factor and prospect for relief through August is not promising.

Philadelphia — While business is good warehouses report a slight falling off and express the opinion that

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May will probably mark the peak for the first half.

Cleveland—Distributors are rushed with orders but are unable to care for all the sheet and strip business coming to them. With mill deliveries extended, stocks of flat-rolled are low and warehouses are seeking to distribute available tonnage as equitably as possible among customers. Bars also are tight, and the same is true of plates. Some relief from consumer pressure is expected next month when many manufacturing plants will close down for vacations.

Cincinnati—Demand is heavy, with sales limited by supply. Inventories are lighter. The rise in galvanized sheets is the only price change.

Chicago—Distributors are absorbing the increases in strip prices effected by eastern mills which supply some material here.

Birmingham—Warehouse steel demand continues brisk for most specifications.

Los Angeles — Warehouse activity grows. Sales in May exceeded April's level by 10 to 15 per cent.

Seattle—Warehouse volume has increased. Stocks are well rounded, but eastern mills are slowing deliveries.

Canada . . .

Toronto, Ont.—Canadian steel production was maintained at a higher daily average rate in April than in March or in the corresponding month last year. Pig iron output for April amounted to 185,259 net tons compared with 174,944 tons in March and 180,740 tons in April, 1949. Production of steel ingots for April amounted to 273,320 net tons compared with 294,303 tons in March and 269,968 tons in April, 1949.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

3400 tons, viaduct connecting Moon and Long islands, Boston harbor, to Bethlehem Steel Co.; Merritt-Chapman & Scott Corp., New London, Conn., general contractor.

3300 tons, contract No. 34, New Jersey Turnpike bridge work, Raritan and Woodbridge townships, Middlesex county, through John Rosenblum Inc., New York, general contractor (successful bid $2,822,633) to Harris Structural Steel Co., that city.

1600 tons, contract No. 29, New Jersey turnpike bridge work, Mercer and Middlesex counties, between Allentown, N. J., and the Raritan river, through Brookfield Construction Co., New York (bid on general contract was $1,161,069) to Harris Structural Steel Co., that city.

1200 tons, Day Square station, East Boston, Massachusetts Transit Authority, to Bethlehem Steel Co.; J. A. Singerella Co., Boston, general contractor.

1070 tons, plant, Lehigh Valley Dairy, Allentown, Pa., to Bethlehem Constructors, Bethlehem, Pa.

275 tons, superstructure, gated portion, Morganza Control structure, New Orleans district; bids July 11, Corps of Engineers, New Orleans; also 123 tons corrosion-resisting steel.

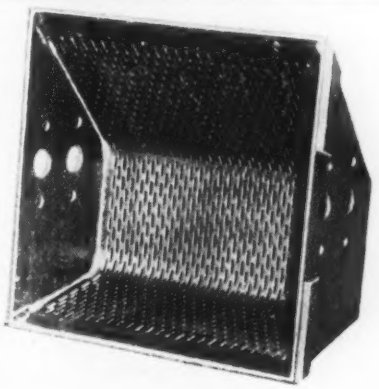
260 tons, Congress street substructure, Chicago, through M. J. Boyle, contractor, to American Bridge Co., Pittsburgh.

200 tons, or more, building addition Mountain States Telephone & Telegraph Co., Boise, Idaho, to Midwest Steel & Iron Works Co., Denver.

150 tons, New York Central turntable, Chicago, to American Bridge Co., Pittsburgh.

125 tons, elementary school, Norristown, Pa.,

Typical of Hendrick's **Manufacturing Facilities**



Hendrick is exceptionally well equipped to manufacture to specifications a wide range of metal products that involve such operations as perforating, shaping, forming, welding, brazing, riveting, etc. The perforated elevator bucket illustrated is typical of the many specialized articles for whose fabrication Hendrick has unusual facilities. Write us in detail regarding any metal product you desire fabricated.

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+ One *Euclid* 3 ton Semi-Gantry Crane
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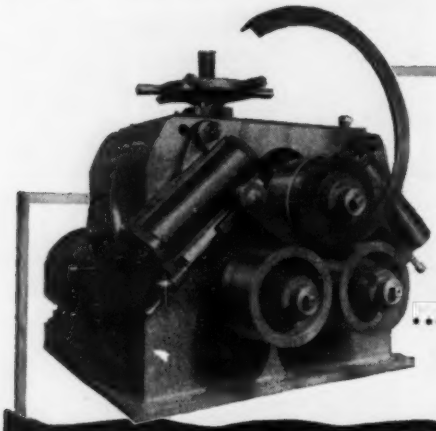

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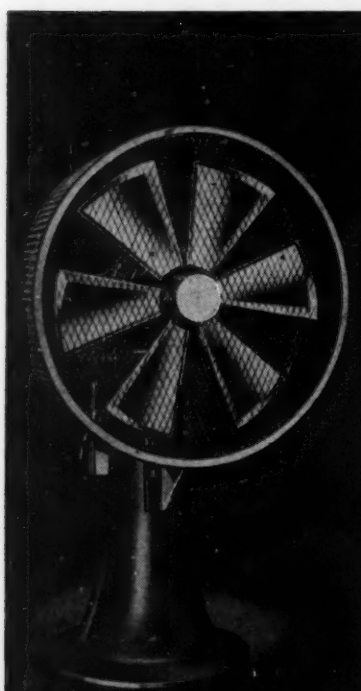

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to Easton Structural Steel Co., Easton, Pa.

100 tons, Chicago Transit Authority span replacement, Chicago, to American Bridge Co., Pittsburgh.

100 tons, grade crossing over Boston & Maine Railroad, Biddeford, Me.; bids June 21, Augusta; also 60 tons, bridge over Bangor & Aroostook, LaGrange, Me.

STRUCTURAL STEEL PENDING

1980 tons, contract No. 37, New Jersey turnpike bridge work, Burlington and Mercer counties; bids June 29.

1980 tons, New Jersey turnpike, contract 37, section 3, Mercer county; bids June 29.

1700 tons, E. J. Frankel apartment, 22nd and Park, Philadelphia; bids June 21.

1480 tons, New Jersey turnpike, contract 36, section 3, Burlington county; general contract awarded to George M. Brewster, Bogota, N. J.

1300 tons, state bridge, Allegheny county, Pennsylvania; bids July 7.

1160 tons, state bridge work, Lancaster county, Pennsylvania; bids June 30.

450 tons, bascule bridge, North Hero, Vt.; bids June 29, Montpelier.

430 tons, New Jersey turnpike, contract 24, section 1, Salem and Gloucester counties; Peerless Contracting Co., New York, low on general contract.

350 tons, warehouse, Sears-Roebuck Co., Boston.

300 tons, contract No. 25, New Jersey turnpike substructures and superstructures for two bridges, one to carry Baltimore & Ohio track, near Bayway avenue, Elizabeth, N. J., over the turnpike right-of-way, and the other under an approach span of Goethals Bridge, between Elizabeth and Staten Island; Poirier & McLane Corp., New York, awarded general contract on a bid of $338,975.

300 tons, plant addition, Flynn Mfg. Co., Philadelphia; bids closed June 16.

275 tons, buildings, Bucklin Point sewage system, East Providence, R. I.; F. H. McGraw Co., Hartford, Conn., low on general contract.

200 tons, 125-ton gantry crane; Willamette Iron & Steel Co., Portland, Oreg., low, $128,185, to Bureau of Reclamation, Denver.

200 tons or more, family quarters, military installations Elelson Field and Fort Richardson, Alaska; awards pending.

170 tons, Pennsylvania turnpike, section 29, Lawrence county; bids July 6.

Unstated tonnage, contract No. 31, New Jersey turnpike construction of substructures of 14 bridges and an abutment of a viaduct, Elizabeth, N. J.; bids June 29; work includes 51,500 feet of bearing piles.

Unstated, also reinforcing 122 x 230 ft machine shop, warehouse and heating plant, Coulee Dam, Wash.; Morrison-Knudsen Co. and Peter Kiewit Sons Co., Seattle, joint low, $1,487,043 to Bureau of Reclamation, Denver.

Unstated, 70-ton gantry crane for Canyon Ferry power project, Montana; bids to Bureau of Reclamation, Denver, June 27.

Unstated, diesel generating plant, Alaska Railroad, Anchorage: J. C. Boespflug Co. and Peter Kiewit Sons, Co., Seattle, joint low, $289,890.

Unstated, railroad and highway bridges, McNary dam project; Utah Construction Co., Richmond, Cal., low $242,079 to U. S. Engineer, Walla Walla, Wash.

Unstated, two-story steel frame addition to Security Market, Seattle; bids to Henry Bittman, architect, Seattle, June 15.

REINFORCING BARS . . .

REINFORCING BARS PLACED

655 tons, state highway bridges, Berkley-Raynham-Taunton, Mass., to Truscon Steel Co., Boston; Campanella & Cardi Co., Hillsgrove, R. I., general contractor.

555 tons, state highway and nine bridges, Plymouth, Mass., to Truscon Steel Co., Bos-

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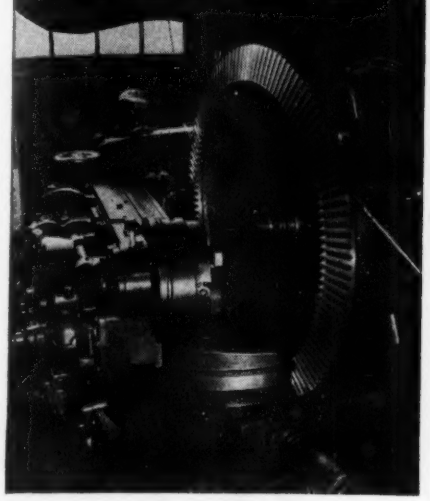
LARGE INDUSTRIAL GEARS



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ton; M. DeMatteo Construction Co., Quincy, Mass., general contractor, $1,877,895.90.

450 tons, dormitory and utilities tunnel, Washington State College, to Bethlehem Pacific Coast Steel Corp., Seattle; Sound Construction & Engineering Co., Seattle, general contractor.

450 tons, Keyhole dam, Wyoming; Knisely-Moore Co., Douglas, Wyo., reportedly low, $1,667,724, to Bureau of Reclamation, Denver.

450 tons, 18-mile railroad relocation, Trenton dam; bids invited by Bureau of Reclamation, Denver.

212 tons, Presbyterian Hospital nurses home, Chicago, to United States Steel Supply Co., that city.

159 tons, Lincoln elementary school, Duluth, Minn., to United States Steel Supply Co., Chicago.

130 tons, Washington state highway projects; bids to Olympia, June 20.

100 tons, abutments and piers for railroad bridge, Lookout Point dam, Oregon; F. W. Case Co., Van Nuys, Cal., apparently low, $204,005, to U. S. Engineer, Portland, Oreg.

100 tons, Washington state highway projects, to Northwest Steel Rolling Mills Inc., Seattle.

REINFORCING BARS PENDING

7000 tons, superstructure, gated portion, Morganza Control structure, New Orleans district; bids July 11, Corps of Engineers, New Orleans.

2030 tons, completion, Trenton dam, Republican River, Missouri Basin project; bids June 23, Bureau of Reclamation, Trenton, Nebr.

900 tons, contract 37, New Jersey turnpike bridge work, Burlington and Mercer counties; bids June 29.

416 tons, hospital nurses home, Madison, Wis.; bids asked.

240 tons, state bridge work, Lancaster county, Pennsylvania, bids June 30.

240 tons, St. Luke's Hospital, Milwaukee; bids asked.

229 tons, Reick-McJunkin Dairy Co., Pittsburgh; bids asked.

225 tons, structures, Potholes East Canal and North Scooteney dike, Columbia basin project, near Othello, Wash.; bids June 23, Bureau of Reclamation, Ephrata, Wash.

107 tons, apartment building, Ridge avenue, Chicago; bids asked.

PIPE . . .

CAST IRON PIPE PLACED

150 tons, 6 in., King County district No. 7, Seattle; to E. N. Hallgren Co., Seattle, for American Cast Iron Pipe Co., Birmingham.

CAST IRON PIPE PENDING

800 tons, 6 inch replacement job, Fort Lewis, Wash.; M. Malaspina, Seattle, low; bids for alternatives under consideration.

150 tons, Edgewood Water Co., Puyallup, Wash., 4 and 6 in. and fittings; bids June 22, also alternatives.

150 tons, 12, 8 and 6 in. and fittings; Moses Lake, Wash.; Utility Construction Co., Seattle, low $43,620.

Unstated, 1960 ft 6 in., bids received by B. F. Hume, city clerk, Olympia, Wash., June 13.

STEEL PIPE PLACED

Unstated, 9160 ft 8 and 6 in. water pipe, Wenatchee, Wash., to Armco Drainage & Metal Products Co., Portland, Oreg., low $19,793.

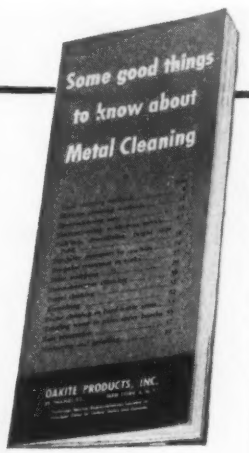
PLATES . . .

PLATES PLACED

600 tons, 15 tanks, Philadelphia Gas Works, Philadelphia, to Dowington Iron Works, Dowington, Pa.

160 tons, steel H-section piling, McNary lock and dam, to David Smith Steel Co., Brooklyn, N. Y., by U. S. Engineer, Walla Walla, Wash.

100 tons, water storage tanks, Bellingham,



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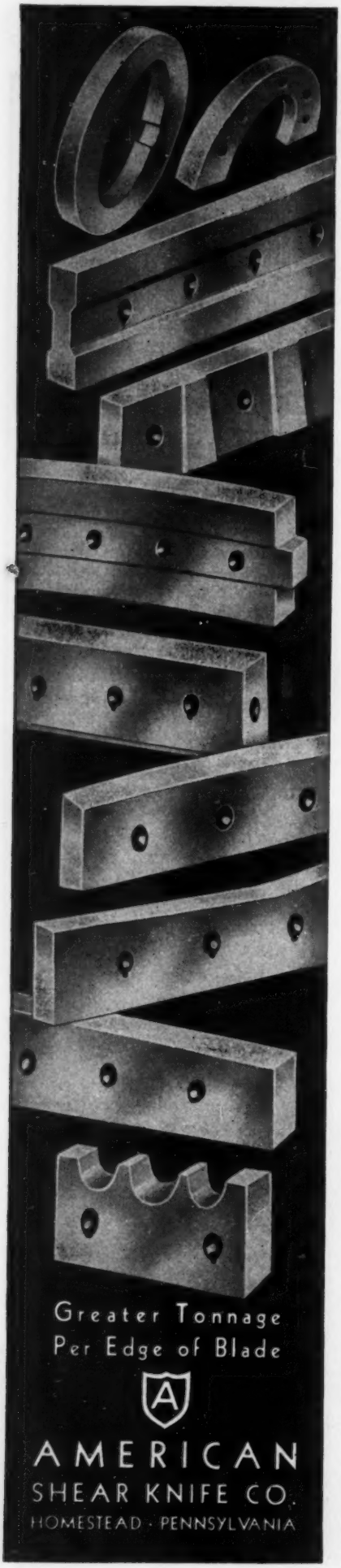

Wash. and Vancouver, Wash., to Chicago Bridge & Iron Co., Seattle.

Unstated, also shapes, fire boat for Vancouver, B. C., to Yarrows Ltd., Victoria, B. C., at $289,500.

Unstated tonnage, nonpropelled 578-ton steel barges, Army Transportation Corps to Newport News Shipbuilding & Dry Dock Co., Newport News, Va., $121,600.

Unstated tonnage, steel hull plates, Navy Department, to Worth Steel Co., Claymont, Del., $191,066.75.

PLATES PENDING

100 tons or more, sewage system outlet, Portland, Oreg.; bids shortly.

100 tons plus, several oil and water storage tanks, Alaska military installations; awards pending.

100 tons, water storage facilities, Madras, Oreg.; bids June 13.

Unstated, six bulk storage tanks, plant for Amalgamated Sugar Co., Portland, Oreg.; Waale-Campau Co., Portland, general contractor.

Unstated, 4½ miles, 36 in. water supply line; plans approved; bids soon to Portland, Oreg.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Clinchfield, six 1200-hp diesel-electric switching units, to Electro-Motive Division, General Motors Corp., La Grange, Ill.

Missouri-Kansas-Texas, two 3-unit 4500-hp passenger locomotives and two 1600-hp road-switching units, to American Locomotive-General Electric companies, Schenectady, N. Y.; these are in addition to eight diesel-electric road-switching engines noted in the June 12 issue of STEEL as going to Baldwin Locomotive Works, Eddystone, Pa.

RAILROAD CARS PLACED

Missouri-Kansas-Texas, 100 seventy-ton covered hopper cars, to Pullman-Standard Car Mfg. Co., Chicago.

New York Central, rail diesel car, to Budd Co., Philadelphia; the third such car to be placed by New York Central with this builder.

RAILROAD CARS PENDING

Southern, 50 seventy-ton steel covered hopper cars, bids asked; this is in addition to 250 seventy-ton covered hopper cars, noted as pending in a previous issue.

Union Pacific, 3500 new or modernized freight cars, contemplated as portion of its 1950 improvement program.

FERROALLOYS

(Continued from Page 143)

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., SMxD, bulk, 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lots 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 20.50c per lb of contained chromium plus 11.30c per pound of contained silicon; 1" x down, bulk 20.65c per pound of contained chromium plus 11.50c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract, carload, 1" x D; packed, max 0.50%

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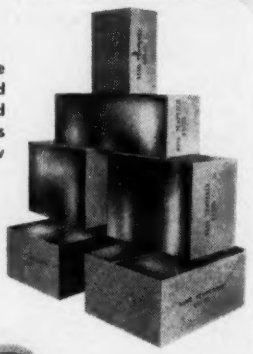
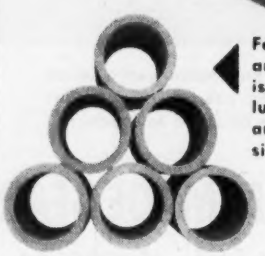
Quality Die Blocks, and associated Piston Rods and Sow Blocks.





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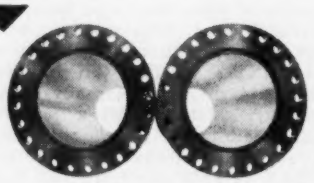
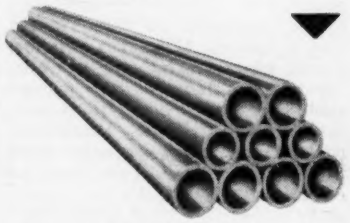


Seamless Forged and Bored Pressure Tubing.



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C grade. $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

Silicon Alloys

25-30% Ferrosilicon: Contract, carload, lump, bulk, 17.00c per lb of contained Si; packed 18.40c; ton lot 19.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk, 14.65-15.0c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe). C.l. lump, bulk, regular 19.0c per lb of Si, c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 7.65c per lb of alloy, ton lots packed 9.05c, 200 to 1999 lb 9.40c, smaller lots 9.90c. Delivered. Spot up 0.5c.

Briquetted Alloys

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 10.45c per lb of briquet, c.l. packaged 11.25c, ton lot 12.05c, less ton 12.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 10.30c, per lb of briquet, c.l. packaged 11.1c, ton lot 11.9c, less ton 12.8c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.l. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.
(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.l. packed 7.10c, ton lots 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching. small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) 95.00c per pound of Mo contained. F.o.b. Langeloth, Pa.

Calcium Alloys

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%.) Contract, carload, lump, bulk 19.25c per lb of alloy, carload packed 20.05c, ton lot 21.55c, less ton 22.55c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 17.9c per lb of alloy, carload packed 19.1c, ton lot 21.0c, less ton 22.5c. Delivered. Spot add 0.25c.

Titanium Alloys

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lots 2" x D, $1.40 per lb of contained Ti; less ton $1.45. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.) Ton lot $1.28, less ton $1.35, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $167 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 3-4.5%.) Contract, $183 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

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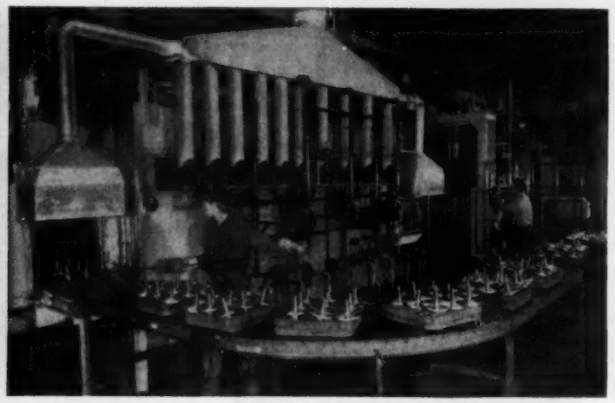

Gas Carburizing
and other heat processing

● The American Iron and Machine Works Company, of Oklahoma City, is heat treating and gas carburizing several different parts — requiring different cycles — in the equipment pictured above which consists of an EF gas-fired radiant tube pusher type furnace, equipped with endothermic gas generator, automatic quench, oil conditioner, heat exchanger, washing machine and draw furnace.

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Vanadium Alloys

Ferrovanadium: Open-hearth Grade (Va 35-55%, Si 8-12% max., C 3-3.5% max.). Contract, any quantity, $2.90 per lb of contained Va. Delivered. Spot, add 10c, **Crucible-Special Grades** (Va 35-55%, Si 2-3.5% max., C 0.5-1% max.), $3. **Primos and High Speed Grades** (Va 35-55%, Si 1.50% max., C 0.20% max.) $3.10.

Grainal: Vanadium Grainal No. 1, 93c; No. 6 63c; No. 79, 45c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.20 per lb contained V_2O_5, freight allowed. Spot, add 5c.

Tungsten Alloys

Ferrotungsten: (70-80%). Contract, 10,000 lb W or more, $2.25 per lb of contained W; 2000 lb W to 10,000 lb W, $2.35; less than 2000 lb W, $2.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Contract or spot, 1000 lb or more, $2.90 per lb of contained W; less than 1000 lb W, $3.

Zirconium Alloys

12-15% Zirconium Alloys: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Contract, c.l., lump, bulk 6.6c per lb of alloy, c.l. packed 7.35c, ton lot 8.1c, less ton 8.95c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract carload, lump, packed 20.25c per lb of alloy ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

Boron Alloys

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min. B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $4.25 per lb contained B, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., frt allowed same as high-carbon ferrotitanium.

Other Ferroalloys

Ferrocolumbium: (Cb 50-60%, Si 8% max., C 0.4% max.). Contract, ton lot, 2" x D, $3.50 per lb of contained Cb, less ton $3.55. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min. C 0.30 max.) ton lots, 2" x D, $2.67 per lb of contained Cb plus Ta, delivered; less ton lots $2.72.

CMSZ Mixes: (No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). 12 M x D, carload packed 19.0c per lb of material, ton lot 19.75c, less ton 21.0c. Delivered.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 43c per lb of alloy, ton lot 45c, less ton 47c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ½" x 12 M, 16.5c per lb of alloy, ton lots 17.50c, less ton 18.5c. Delivered, Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.00c per lb of alloy; ton lots 18.00c; less ton lots 19.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 14.25c per lb of alloy; ton lots 15.75c; less ton lots 17.00c. f.o.b., Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al). Lump, bulk, carload 11.00c. Ton lots, bulk 11.50c, packed 11.75c. Less ton lots, packed 12.25c per lb of alloy, f.o.b. Philo, O., with freight not to exceed railroad freight allowed to destination.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. seller's works, Mt. Pleasant, or Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, f.o.b. Langeloth and Washington, Pa., furnace, any quantity $1.13.

Technical Molybdic-Oxide: Per lb, contained Mo., f.o.b. Langeloth and Washington, Pa., packed in bags containing 20 lb of molybdenum, 95.00c.

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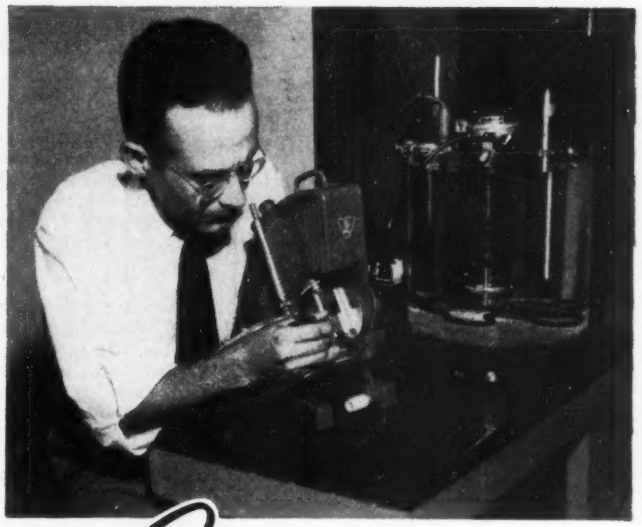

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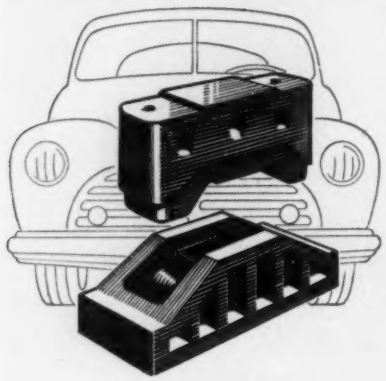

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Metalworking Briefs

CONSTRUCTION, ENTERPRISE ORGANIZATIONAL CHANGES

Alabama

Regional (southeastern) headquarters of **Air Reduction Sales Co.,** New York, will be established in Birmingham immediately. The office will be headquarters for the district comprising Alabama, Mississippi, Florida and parts of Georgia.

California

Standard Steel Spring Co., Coraopolis, Pa., is building a plant in Los Angeles. It is to be used for manufacturing seat and back cushion springs and seat frames for passenger cars. The plant is to be completed by Aug. 1.

California

Sutherland Paper Co., Kalamazoo, Mich., expects to begin construction in July of a new $750,000 plant at Santa Clara, Calif. Production in the new facility is expected to begin in October. It will be Sutherland's first plant west of the Mississippi.

California

Ferry-Morse Seed Co., Detroit, is planning a new $1 million plant at Mountain View, a short distance south of San Francisco. Its present plant is located in San Francisco from which it will move about the middle of next year.

Delaware

Delaware Steel Service Inc., steel construction, files a charter of incorporation with the corporation department of the secretary of state's office at Dover, Del. Capital of the firm is listed at 200 shares of stock, no par value. Joseph Donald Craven, Wilmington, Del., is serving as the resident agent.

Delaware

Mid-States Steel Supply Co.—steel—has been chartered by the corporation department of the secretary of state's office at Dover, Del. Corporation Trust Co., Wilmington, Del., is serving as the principal office.

Florida

Gainesville Co., Gainesville, Fla., plans to build a hosiery plant in that city. The company will install more than $400,000 in knitting machinery and equipment.

Illinois

Bloomfield Industries Inc., Chicago, metal specialties manufacturer, will build a one-story building at 4546 W. 27th St., that city.

Illinois

Motorola Inc., Chicago, has acquired a building at 2700 N. Clybourn Ave. to be operated as a branch plant in the manufacture of radio and television sets.

Illinois

Ekco Products Co., Chicago, is constructing an addition to its kitchen utensil manufacturing plant.

Illinois

Sentinel Radio Corp., Evanston, Ill., producer of radio and television equipment, is constructing an addition to its plant.

Illinois

R. J. Callahan Engineering Co., Springfield, Ill., was appointed central Illinois distributor of **Service Caster & Truck Corp.,** manufacturer of material handling equipment.

Illinois

Electro-Motive Division, **General Motors Corp.,** LaGrange, Ill., awards the general contract for construction of a $100,000 addition to its plant in that city to **Ragnar Benson Inc.,** Chicago 51.

Illinois

Plans for a $2 million factory building in Melrose Park, Ill., are being prepared for a client of Skidmore, Owings & Merrill, architect, 100 W. Monroe St., Chicago 3, Ill.

Illinois

Emergency Steel Sales Co., Skokie, Ill., awards the general contract for construction of a steel fabricating plant to Morris Handler, 2817 W. Chicago Ave., Chicago. Estimated cost of the project, exclusive of equipment, is $125,000.

Indiana

P. R. Mallory & Co. Inc., Indianapolis, is producing large titanium alloy ingots. Navy Bureau of Aeronautics announced recently that a Mallory titanium alloy has been developed for use in jet aircraft engines.

Louisiana

Ethyl Corp., Detroit, awards a contract to **James Stewart & Co. Inc.,** Dallas, at $672,000 for a central building and storage unit for plant at Baton Rouge, La. Albert Kahn & Associates, Detroit, is the architect.

Maryland

Bendix Aviation Corp., Detroit, awards contract to **J. H. Williams & Co. Inc.,** Baltimore, for an addition to its manufacturing building in Towson, Md.

Massachusetts

United-Carr Fastener Corp., Cambridge, Mass., is constructing an additional five-story manufacturing building which will connect two operating units, permitting straight-line production from raw material to finished product.

Massachusetts

Westinghouse Electric Corp., Pittsburgh, will build a $2 million warehouse at Belmont, Mass.

Michigan

Hendey Machine Co., Torrington, Conn., discontinues its sales office at 1534 Dime Bldg., Detroit. **Associated Machinery Sales,** 147 Jos. Campau, Detroit, and 1 N. Main St., Clarkston, Mich., is now representing the company as its agents for the Michigan territory. Thor M. Olson is president of Associated Machinery.

Missouri

Hussmann Refrigerator Co., St. Louis, awards contract to **Fruin-Colnon Contracting Co.,** that city, for a warehouse. Estimated cost is $600,000.

Missouri

American Fixture & Mfg. Co., St. Louis, awarded contracts to the I. E. Millstone Construction Co., that city, for construction of additional buildings for its plant in the vicinity of 4300 Semple Ave. The new buildings are to include a 1-story factory addition and a 2-story factory office building. C. C. Price, St. Louis engineer, prepared the plans.

New Jersey

Wheel Trueing Tool Co., Detroit, has changed the name of its eastern subsidiary, **Adamant Tool Co.,** Bloomfield, N. J., to **Wheel Trueing Tool Co. of New Jersey.**

New York

Jamestown Metal Corp., Jamestown,

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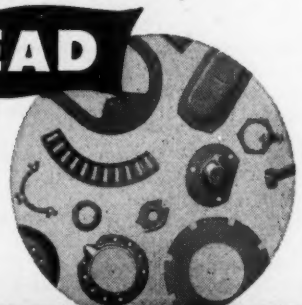

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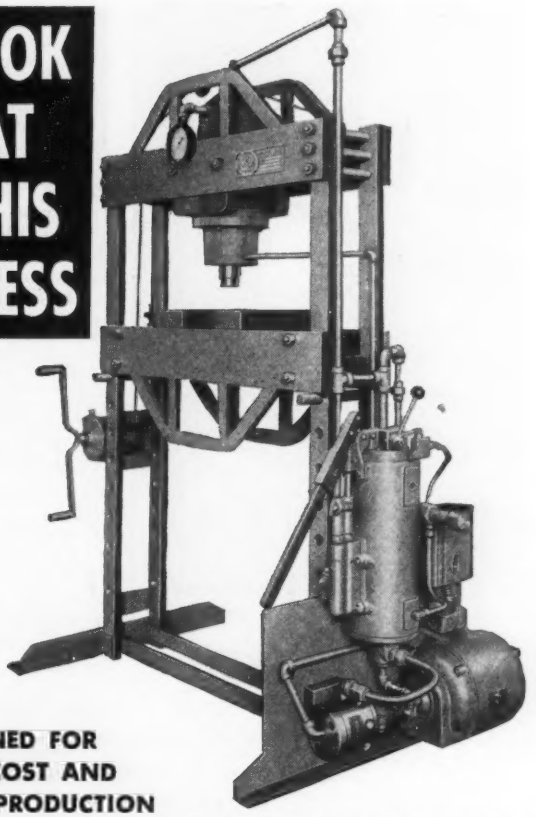

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Depending upon capacity of pumping equipment, prices of Standard model motor driven hydraulic presses are as follows, F. O. B. Factory: 25-ton press from $727.00 to $992.00. 50-ton press from $806.00 to $1058.00. 60-ton press from $1070.50 to $1135.00. 75-ton press from $1198.00 to $1258.00. All motors in the above units are 220/440 volt, 3 phase, 60 cycle. Any change in motor specifications is extra. **Subject to change without notice.*

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N. Y., has purchased the Duramold plant in that city, constructed during the war at a cost of $1.5 million. The company will use the plant for manufacturing purposes and will purchase 90 per cent of the outstanding shares of the two plants of **Excel Metal Cabinet Co.**, Falconer, N. Y.

New York

Rheem Mfg. Co., New York, has scheduled a $4,250,000 expansion program this year. Of this budget, some $3.5 million will be spent to extend the company's new Rheemcote process, a method of color lithographing 55-gal. steel shipping drums (see STEEL, June 12, p. 66). The process, developed at the firm's New Orleans plant, will be extended to include production at plants at Chicago, Houston, Baltimore and Richmond, Calif. Rheem also will build a factory at Bristol, England, at a cost of $700,000. Production of steel drums is scheduled to start there early next year. The company has just completed a $600,000 expansion of its plant in Chicago which primarily produces home water heaters.

New York

Albert & Davidson Pipe Corp., Brooklyn, N. Y., firm of jobbers in iron and steel pipe, valves and fittings, etc., will drop the "Albert" from its name and adopt the trade name, Davidson Pipe Co. Inc., July 1.

Ohio

Standard Transformer Co., Warren, O., appointed **A & A Supply Co.**, with offices at Albuquerque, N. M., and Abilene, Tex., as its representative in New Mexico and northwestern Texas.

Pennsylvania

Stainless Products Corp., a New York corporation, has been organized to market tanks of stainless steel and allied metals on a worldwide basis. E. S. Heinsohn, president of Stainless Products Corp., Portersville, Pa., formerly the Stainless Welding & Mfg. Co., said the new sales company will sell and service the entire production of his factory. Headquarters, showroom, export and eastern regional offices of Stainless Products Corp. are in the Graybar Bldg., 420 Lexington Ave., New York.

Rhode Island

Cogsdill Twist Drill Co., Detroit, appoints **L. R. Clowes Inc.**, Providence, R. I., as its representative in New England. The company also appoints these distributors: **Wilson-Garner Co.**, Detroit; **Tool Reserve Corp.**, Chicago; **Kut-Rite Tool Co.**, Chicago; **Nelson & Storm Tool Supply**, Rockford, Ill.; **Buehler Equipment Co.**, Philadelphia; **Haines Tool Co.**, Cleveland; **Industrial Sales & Service Inc.**, South Bend, Ind.

Tennessee

Harriman Utility Board, Harriman, Tenn., let a contract to **A. Farnell Blair Co.**, Atlanta, for a municipal-utility building. Estimated cost is $223,727.

Texas

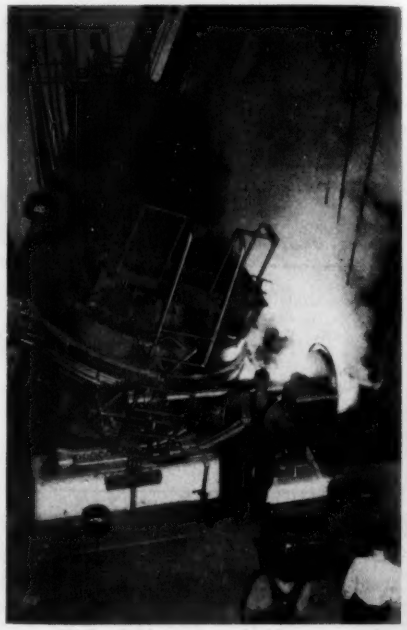
Potash Co. of America, Carlsbad, N. Mex., plans to build a $750,000 plant about six miles north of Dumas, Tex., for production of hydrochloric acid, potassium sulphate and sodium sulphate. Stearns- Roger Mfg. Co., Denver, will build the plant.

Texas

Dow Chemical Co., Midland, Mich., plans a $30 million expansion program for its Freeport-Velasco, Tex., plant. It will involve power facilities and the plant's ethylene, chlorine, styrene, glycol, and vinyl chloride units.

Vermont

Lovejoy Tool Co. Inc., Springfield, Vt., appoints **Fred C. Ahrendt Co.**, Toledo, O., as representative in Toledo, northwestern Ohio and southern Michigan.



TWO MOORE LECTROMELTS: Electric Steel Foundry, Portland, Oreg., added two Moore Rapid Lectromelt furnaces to its melting equipment. Largest of the furnaces is a Moore PT. It is being maintained on a production schedule of a 6500-pound heat every hour and three-quarters. The other Moore is tapped every hour and fifteen minutes for a 1500-pound alloy heat for production of ESCO Spuncast and high alloy steel castings

Wisconsin

Chain Belt Co., Milwaukee, appoints as distributors for the merchandise products of the Chain & Transmission, Baldwin-Duckworth, and the Conveyor & Process Equipment divisions of the company: **Guntert & Zimmerman Sales Division Inc.**, Stockton, Calif.; **Union Supply Co.**, Denver; **Green's Hardware & Machinery Co.**, Crowley, La.; **Bush-Brehner Inc.**, York, Pa.; **Klamath Machinery Co.**, Klamath Falls, Oreg.; **Hopper Machine Works**, Bakersfield, Calif. The company also appoints as distributors for the products of the Chain & Transmission and Baldwin-Duckworth divisions: **Precision Gear & Machine Co.**, Charlotte, N. C.; **Stacy Supply Co.**, Springfield, Mass.; **Transmission Supplies Inc.**, Greensboro, N. C.

India

National Radio & Engineering Co. Ltd., Bruce street, Fort, Bombay, changes its name to **National Ekco Radio & Engineering Co. Ltd.**

Canada

Tube Turns Inc., Louisville, appoints **J. T. Wing & Co.**, Windsor, Ont., as distributor of its welding fittings and flanges in Canada.